REPORT

Substance Abuse, Treatment, and Birth Outcomes for Pregnant and Postpartum Women in Washington State

Washington State
Department of
Social and Health Services
Planning, Research &
Development
Office of Research &
Data Analysis

SUBSTANCE ABUSE, TREATMENT, AND BIRTH OUTCOMES FOR PREGNANT AND POSTPARTUM WOMEN IN WASHINGTON STATE

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Table of Contents

EXECUTIVE SUMMARY

The abuse of alcohol and illicit drugs during pregnancy is associated with poor birth outcomes, child abuse, and increased infant mortality. This report describes women who gave birth in the state of Washington in the year July 1, 1991 through June 30, 1992 and identifies a group of women who abused substances while they were pregnant or in the year postpartum. The demographic characteristics and birth outcomes of substance abusers are examined, and substance abusers who received prenatal substance abuse treatment are compared to those who did not receive treatment. This study also explores the relationships between the amount and type of treatment received and maternal characteristics and birth outcomes.

Key Findings

- **Substance abusers have many characteristics which are associated with high medical expenditures and poor birth outcomes. Compared to women not identified as substance abusers, they are more likely to be single, to be poor, to smoke cigarettes, to experience preterm labor, to experience injuries or fractures in the prenatal period, to be diagnosed with mental illness, and to be hospitalized in the prenatal period for a non-substance abuse related medical problem.**

- **Compared to other infants, children born to substance abusers are more likely to be premature, to be small for their gestational age, to be low birthweight at the time of birth, to die in the first year of life, to be referred to Child Protective Services, to be placed outside the home, and to have high medical expenses in their first year of life.**

- **Children born to women with substance abuse treatment in the prenatal period are more likely to be full-term, to be normal birthweight, and to develop adequately in utero than the children of women who were identified in the prenatal period as abusing substances but who failed to receive substance abuse treatment.**

- Women who receive outpatient treatment in combination with residential treatment have better birth outcomes and lower infant Medicaid expenditures than women who only receive residential treatment. Children of women with a minimal amount of substance abuse treatment have very high Medicaid expenditures in their first year of life.

Conclusions: This report offers evidence that prenatal substance abuse treatment improves infant health. This study also found a high rate of out-of-home placements among infants born to substance abusers.

Study sample: This study reports on Washington residents who gave birth in the year July 1, 1991 through June 30, 1992. Information from the First Steps Database and TARGET was used to identify maternal substance abuse and substance abuse treatment. Women were categorized into groups based on substance abuse identification, receipt of substance abuse treatment, and receipt of Medicaid-paid maternity care. The group of women who received prenatal substance abuse treatment was then examined more closely in order to explore the relationship between type and duration of substance abuse treatment and maternal characteristics and birth outcomes.

Data sources: The primary sources of data used in this study were three databases maintained by Washington's Department of Social and Health Services: the Office of Research and Data Analysis' First Steps Database which contains birth certificate information and Medicaid claim data; the Division of Alcohol and Substance Abuse's TARGET database with information on publicly-funded substance abuse treatment; and Children and Family Services' CAMIS database which has information on out-of-home placements and referrals made to Child Protective Services.

Limitations: Many factors affect birth outcomes and medical expenditures, and the groups used in this report differ on characteristics other than substance abuse. Substance abuse is associated with a cluster of health and reproductive risk factors including cigarette smoking, poor prenatal and medical care, low income, mental illness, and single parenthood. Given this clustering of risk factors, substance abuse is not the only factor contributing to the group differences presented in this report and causal relationships cannot be imputed. The group of substance abusers first identified in the postpartum period faces a selection bias because of their birth outcomes: women with poor birth outcomes are more likely to be screened for substance abuse than women who give birth to a healthy, full-term infant. The residential treatment groups have a different selection bias: women referred to residential rather than outpatient treatment have more medical risks and more serious substance abuse problems. Last, since this study relied on Medicaid claims and the receipt of publicly-funded substance abuse treatment for the identification of substance abusers, few women who did not receive Medicaid support for their maternity care could be identified as substance abusers.

Main Findings:

Substance Abuse and Birth Outcomes

- The rate of low birthweight (less than 2500 grams, or 5.5 pounds) for singleton liveborn infants was lower for women who received prenatal substance abuse treatment (9.6%) than for substance abusers identified but not treated in the prenatal period (13.0%) and women first identified in the postpartum period (14.7%). Low birthweight rates for all three groups of identified substance abusers were substantially higher than those for Medicaid women not identified as abusing substances (5.3%) or non-Medicaid women (3.3%).

- Singleton infants born to women who received substance abuse treatment in the prenatal period were slightly less likely to be full-term (84%) than the infants born to Medicaid women not identified as abusing substances (87%). In contrast, only 80% of singleton

infants born to women identified but not treated in the prenatal period were full-term, and 76% of infants born to women first identified in the postpartum period were full-term.

Substance Abuse and Child Abuse and Neglect

- Out-of-home placements occurred for 13.6% to 21.6% of infants born to substance abusing women. These rates were over seven times that for infants born to Medicaid women not identified as abusing substances (1.9%) and over fifty times the rate of out-of-home placements for infants born to non-Medicaid women (0.2%). Among all infants born in the study year who were placed outside the home, 37% were children of women identified as abusing substances even though only 2.5% of all births were to these women. (Over 90% of placements lasted more than 60 days and over half had no end date in CAMIS.)

- Over one-third (35.5%) to one-half (51.7%) of infants born to substance abusing women were reported as at high risk of imminent harm in accepted referrals to Child Protective Services for child abuse or neglect. These rates were over three times greater than the rate of accepted referrals for infants born to Medicaid women not identified as abusing substances (11.6%) and over twenty times greater than the rate of accepted referrals for infants born to non-Medicaid women (1.7%). Among all infants born in the study year with accepted referrals to Child Protective Services, 18% were children of women identified as abusing substances even though only 2.5% of all births were to these women.

Substance Abuse and Medicaid Expenditures

- The average Medicaid payment for substance abuse treatment for women with Medicaid-paid substance abuse treatment in the prenatal period was $2,262. The average Medicaid expenditure for hospital-based prenatal substance abuse treatment ($4,600) was ten times the average Medicaid expenditure for outpatient substance abuse treatment in the prenatal period ($429). Most of the women with hospital-based treatment were medically high risk pregnant women who were admitted for medical stabilization. (These amounts exclude DASA payments made through reimbursement systems other than Medicaid.)

- The average Medicaid payment (excluding substance abuse treatment) for maternal medical care among women identified as substance abusers in the prenatal period ($5,825 to $6,049) was higher than that for women first identified in the postpartum period ($4,782) or for Medicaid women with no identified substance abuse problem ($4,076).

- Almost 20% of Medicaid women identified in the prenatal period as abusing substances had a hospitalization in the prenatal period which did not involve substance abuse treatment, a rate of prenatal hospitalization substantially higher than that for women first identified as abusing substances in the postpartum period (8%) or for Medicaid women with no identified substance abuse problem (7%).

- Medicaid payments in the prenatal period were higher in all four categories of medical care among Medicaid women identified during pregnancy with a substance abuse problem compared to Medicaid women with no identified substance abuse problem: inpatient payments were three times higher ($549 to $598 versus $147); prenatal outpatient payments were $250 higher ($1,209 to $1,287 versus $926); other outpatient payments were almost twice as high ($389 to $453 versus $223); and payments for enhanced prenatal care services were about twice as high ($310 to $422 versus $165).

- The average Medicaid expenditure for prenatal Maternity Support Services (MSS) and Maternity Case Management (MCM) was higher for women with prenatal substance abuse treatment ($422) than for other identified substance abusers ($206 to $310) or Medicaid women not identified as abusing substances ($165). This is consistent with a very high use rate of these services by women with prenatal substance abuse treatment (72% for MSS; 58% for MCM) compared to other identified substance abusers (53% to 67% for MSS; 33% to 42% for MCM) or Medicaid women not identified as abusing substances (55% for MSS; 18% for MCM).

- The average Medicaid expenditures for infant care during the first year of life for infants born to women identified as abusing substances ($4,039 to $4,364) was 1.5 times that for the infants of Medicaid women with no identified substance abuse problem ($2,776).

Substance Abuse, Pregnancy and Entry Into Treatment

- Among women with prenatal substance abuse treatment, the proportion with first trimester prenatal care (57%) was much higher than that among identified substance abusers who did not receive prenatal substance abuse treatment (50% to 51%). On the other hand, it was slightly lower than the proportion with first trimester prenatal care among Medicaid women not identified as substance abusers (61%) and much lower than that for non-Medicaid women (85%).

- The proportion of women with a subsequent Medicaid-paid delivery within two years was the same for women who received prenatal substance abuse treatment (12.0%) as for Medicaid women with no identified substance abuse problem (12.7%). Among identified substance abusers who did not receive prenatal substance abuse treatment, a higher proportion had a subsequent Medicaid-paid delivery within two years (16.0% to 19.8%).

Substance Abuse and Maternal Characteristics

- The rate of smoking among women identified as substance abusers was almost 60%, twice the rate for Medicaid women not identified as substance abusers (27%) and more than five times the rate of smoking for non-Medicaid women (11%).

- Approximately 75% of pregnant women identified as substance abusers were unmarried, compared to about 50% of Medicaid pregnant women who were not identified as substance abusers and less than 10% of non-Medicaid pregnant women.

- Approximately 75% of substance abusing women who received Medicaid-paid maternity medical services also qualified for income assistance, while less than half (46.5%) of Medicaid women with no identified substance abuse problem received income assistance.

Substance Abuse Treatment Modality

- Women who received only residential substance abuse treatment had consistently poorer birth outcomes than did other women with prenatal substance abuse treatment, with 18.1% premature, 7.1% small for gestational age, and 11.0% low birthweight (singletons only). However, women who received both outpatient and residential treatment had better birth outcomes (12.4% premature, 4.1% small for gestational age, and 9.4% low birthweight).

- The average Medicaid expenditure for infant care in the first year of life for the children of women who received both residential and outpatient treatment was $2,586, substantially lower than for infants born to substance abusers in the other three groups. The average payment for infants of women with minimal treatment was 2.3 times higher ($6,065), and payments for infants born to women with only outpatient treatment or only residential treatment were 1.5 times higher ($3,984 to $4,011).

- Over 26% of women with only residential treatment were hospitalized for a non-substance abuse specific reason during the prenatal period, substantially more than for women with residential and outpatient treatment (20%), minimal treatment (16%), or only outpatient treatment (15%). Two explanations are possible: either women in residential treatment have greater frequency of health problems needing hospitalization or they are more likely to be hospitalized for less severe conditions.

- Compared to women in the two residential treatment groups, women who received only outpatient treatment are more likely to be pregnant with their first child (37% versus 22% to 27%), to be married (30% versus 18% to 19%), and less likely to abuse cocaine (17% versus 63% to 70%) or to receive income assistance (70% versus 85% to 87%).

- Over 20% of women with minimal treatment had a subsequent Medicaid-paid delivery within two years, almost twice the proportion for the other three groups of treated substance abusers (9.2% to 11.6%).

- Among women who received residential treatment, only 25% of black women also received outpatient treatment compared to over 50% of white women.

ACRONYMS

ADATSA	Alcoholism and Drug Addiction Treatment and Support Act
AFDC	Aid to Families with Dependent Children
CAMIS	Case and Management Information System
CPS	Child Protective Services
CPT	Current Procedural Terminology
DASA	Division of Alcohol and Substance Abuse
DRG	Diagnostic Related Group
DSHS	Department of Social and Health Services
FPL	Federal Poverty Level
ICD-9	International Classification of Disease - Revision 9
IUGR	Intrauterine Growth Retardation
LBW	Low Birthweight
MCM	Maternity Case Management
MSS	Maternity Support Services
OBRA	Omnibus Budget Reconciliation Act
ORDA	Office of Research and Data Analysis
PROM	Premature Rupture Of Membrane
SAMS	Substance Abuse Management System
SGA	Small for Gestational Age
SSPS	Social Services Payment System
TARGET	Treatment and Report Generation Tool
VLBW	Very Low Birthweight

INTRODUCTION

The abuse of alcohol or illicit drugs during pregnancy endangers infant and maternal health. It is associated with low birthweight, infant mortality, developmental delay, and medical complications (Jones and Lopez, 1990). The reduction of low birthweight is a major public health objective, for low birthweight is associated with infant mortality and childhood morbidities such as neurological problems, mental retardation, learning disorders, and lower respiratory tract infections (*Healthy People 2000,* 1991*)*. The major effect of illicit drug use in the short-term is low birthweight and prematurity; in the long-term the primary consequence of illicit drug use is child placement in foster care (Feldman et al., 1992; Robbins and Mills, 1993). Alcohol abuse is associated with fetal growth deficiencies, characteristic facial features and central nervous system dysfuntions, including delayed development and hyperactivity (Abel, 1984; *Healthy People 2000,* 1991; Streissguth, 1994). In the long-term, alcohol abuse is associated with attentional and learning problems, mental retardation, and is "the leading preventable cause of birth defects" (*Healthy People 2000,* 1991:164; Clarren and Smith, 1987; Streissguth et al., 1994).

Prevalence estimates of substance abuse among pregnant women vary widely, but most large-scale studies suggest that between 8% and 20% of births are to substance abusing women. A study of women in Pinellas County, Florida, found that 15% were abusing either alcohol or illicit drugs when they first presented for prenatal care (Chasnoff, Landress, and Barrett, 1990). A large study of ten major hospitals in five cities by the United States General Accounting Office (1990) estimated that 1.3% to 18.1% of births involved drug-exposure, and they attributed most of the variation in substance abuse rates to the aggressiveness used by the hospital in detecting substance abuse. Substance abuse rates may be much higher in certain locations; a large Detroit hospital screened 3,000 infants at birth and found 44% tested positive for illicit drugs (Ostrea et al., 1992).

In 1989 Washington State passed two laws designed to improve prenatal care and infant health. The Maternity Care Access Act extended Medicaid-paid prenatal care to women with incomes up to 185% of the Federal Poverty Level and expanded covered prenatal care services to include Maternity Support Services and Maternity Case Management. Pregnant women were singled out in the Omnibus Drug Act and given the highest priority for eligibility determination and placement in publicly-funded substance abuse treatment. Together these two acts were designed to give priority to the identification and treatment of substance-abusing pregnant women, to coordinate the provision of prenatal care with other services, and to provide treatment services which address the unique needs of pregnant and parenting women (Washington State Division of Alcohol and Substance Abuse, 1993).

This report examines the demographic and medical characteristics of substance abusing women and the health status of their infants. For all women giving birth in the year July 1, 1991 through June 30, 1992, a subset of women who abused substances while they were pregnant or in the year following delivery was identified. These identified substance abusers were compared to other women in terms of their demographic characteristics, risk factors, medical characteristics, and birth outcomes. In order to examine the efficacy of treatment, women identified as substance abusers in the prenatal period were divided into two groups based on whether or not they

received prenatal substance abuse treatment, and the characteristics and birth outcomes of these two groups were compared. Women who received prenatal substance abuse treatment were grouped according to the treatment which they received in order to explore the association between the amount and type of treatment received and maternal characteristics and birth outcomes. In summary, this report describes the characteristics and birth outcomes of pregnant and postpartum women identified as abusing substances, compares the characteristics and birth outcomes of substance abusing women who received prenatal substance abuse treatment to those who did not, and explores the relationship between the type of substance abuse treatment received and maternal characteristics and infant outcomes.

DATA SOURCES

The primary sources of data used in this report were three databases maintained by Washington's Department of Social and Health Services (DSHS): the First Steps Database maintained by the Office of Research and Data Analysis; Treatment and Report Generation Tool (TARGET), maintained by the Division of Alcohol and Substance Abuse; and the Case and Management Information System (CAMIS), maintained by the Division of Children and Family Services.

TARGET is the management information system used by the Division of Alcohol and Substance Abuse (DASA) to record information on publicly-funded treatment services for substance abusers in Washington State. TARGET contains assessment, admission, service provision, demographic and discharge data from treatment agencies across the state. Appendix A describes the variables and source files from TARGET used for this report.

The First Steps Database provides a single repository for data elements from different source files (birth certificates, infant death certificates, maternal and infant services paid by Medicaid, and Medicaid eligibility history). Birth certificates provided by the Center for Health Statistics of the Department of Health contain data on prenatal care, pregnancy outcomes, and background information for all births to Washington State residents. The First Steps Database links birth certificates to Medicaid claims and eligibility. The Medicaid claims contain extensive information on Medicaid payments for maternal and infant care, type of medical care, and medical diagnoses. The First Steps Database was developed and is maintained by the Office of Research and Data Analysis (ORDA) in DSHS. The identification of substance abuse treatment on Medicaid claims is described in Appendix B. The linkage between substance abuse information in TARGET and the First Steps Database is discussed in Appendix C. The diagnoses used to identify substance abuse on Medicaid claims are presented in Appendix D.

CAMIS is maintained by the Division of Children and Family Services. It contains information on referrals to Child Protective Services and out-of-home placements. Accepted referrals involve allegations serious enough to constitute abuse if substantiated upon investigation. The CAMIS database was started in July 1991 and was implemented on a statewide basis in early 1992. Information from CAMIS was linked to the First Steps Database for this study.

ANALYSIS GROUPS

Statewide Births. The demographic characteristics, birth outcomes, prenatal care, and Medicaid payments for women who were identified as substance abusers were compared to all other women who gave birth in the year July 1, 1991 through June 30, 1992. Substance abusers were identified based on medical diagnoses on Medicaid claims and on substance abuse treatment information in the First Steps Database and TARGET. Based on whether or not they were identified in the prenatal period and whether or not they received prenatal treatment, identified substance abusers were divided into three groups: prenatal substance abuse treatment; prenatal substance abuse diagnosis but no treatment; and postpartum substance abuse diagnosis or treatment. These three groups were compared to two groups of women who were not identified as substance abusers, women who had Medicaid-paid maternity services and women who did not.

Prenatal Treatment Modality. Women who received prenatal substance abuse treatment were divided into four groups in order to further explore the relationship between substance abuse treatment and outcomes. Women were categorized according to their receipt of either residential treatment (including hospital-based and freestanding intensive inpatient, recovery house, and long term care) or outpatient treatment (including both intensive outpatient and outpatient). Thresholds of 18 days for outpatient treatment and 7 days for residential treatment were used to define four groups of women with prenatal substance abuse treatment: minimal treatment; outpatient treatment only; residential and outpatient treatment; and residential treatment only.

VARIABLES

The findings are presented in eight tables for each of the two analysis groups. This section describes the variables reported in each table.

1. Demographic Characteristics

Demographic characteristics were obtained from the birth certificate. These variables were available for all women.

Race. Maternal race was ascertained by self-report as recorded on the birth certificate. The terminology and definitions for race are consistent with those used by the National Center for Health Statistics with the exception of Hispanic women. The Washington birth certificate includes Hispanic in the list of choices for race, in addition to another question about Hispanic origin or descent. Women were identified as Hispanic if the race was listed as Hispanic, regardless of the response to the Hispanic origin/descent question.

Age. Mother's age at the time of delivery was computed from the mother's date of birth and the delivery date of her baby as reported on the birth certificate.

Marital Status. The mother's marital status at the time of delivery was obtained from the birth certificate.

Prior Children. Number of prior children is the number reported as living at the time of the new baby's birth on the birth certificate.

2. Risk Factors, Prenatal Care and Medicaid Eligibility

Birth certificates, Medicaid claims and eligibility history, and TARGET data were used as sources for these measures.

Prenatal Care Began. The trimester prenatal care began was computed from the month of pregnancy that prenatal care began as reported on the birth certificate.

Smoking. Smoking history during pregnancy was determined from the birth certificate variable for the number of cigarettes smoked per day during pregnancy. Smokers were mothers who reported any smoking during pregnancy.

Drug(s) of Choice. Both TARGET and Medicaid claims were used to ascertain mother's drug(s) of choice. From TARGET, the first drug of choice (regardless of frequency of use) and up to two additional drug(s) with a stated frequency of use of at least once a month are reported for each woman. (See Appendix A for more detail.) Medicaid claims in the First Steps Database were used to identify drugs based on diagnostic codes. Unfortunately, many Medicaid diagnostic codes do not identify specific drugs. (See Appendix E for more detail.) The maximum number of drugs reported for any woman was four.

Medicaid Eligibility. Women with Medicaid-paid prenatal care or delivery were identified as Medicaid eligible. Medicaid eligibility may be used as an indicator for low socio-economic status, as only women with family incomes below 185% of the Federal Poverty Level (FPL) are eligible for Medicaid.

3. Medicaid Status and Enhanced Prenatal Care

Medicaid claims and eligibility history provide information about these measures only for Medicaid women.

Medicaid Status. Women who were Medicaid-eligible at the time of delivery were divided into three groups, based on the type of program which entitled them to Medicaid coverage. Grant Recipient women received Medicaid coverage as well as monthly financial assistance (cash grants). Most of the women in this group received cash grants through Aid to Families with Dependent Children (AFDC), the Family Independence Program, or a state-funded pregnancy program. Pre-First Steps Medicaid Only women were not eligible to receive grants, but were eligible for Medicaid services through programs such as Medically Needy, Medically Indigent, or Categorically Needy under OBRA 86 legislation. In general, women in this group had incomes below 90% of the FPL. First Steps Expansion women were eligible for Medicaid through the expansion of Medicaid coverage to pregnant women with incomes up to 185% of the FPL. This

expansion, commonly known as First Steps, was implemented in August 1989. These eligibility groups provide further information about income levels in the study populations.

The First Steps program also implemented enhancements in the scope of covered services for pregnant women: Maternity Support Services (MSS) and Maternity Case Management (MCM). Information about the use of MSS and MCM was obtained from Medicaid claims in the First Steps Database.

Maternity Support Services. Maternity Support Services (MSS) are available to all Medicaid-eligible women throughout pregnancy and 60 days postpartum. These services include nutritional services, psychosocial assessment and counseling, community health nursing, community health worker visits, childbirth education, and child care.

Maternity Case Management. Maternity Case Management (MCM) is targeted to teens (less than 18 years of age), chemically dependent women, women with alcohol or drug abuse present in their environment, and women with at least three criteria associated with poor maternity outcomes (such as homelessness, lack of a support system, medical factors, education of eighth grade level or lower, and entry into prenatal care after 28 weeks). The goal of MCM is to identify factors in the woman's life which might adversely affect birth outcomes and to facilitate referrals to needed specialty services.

4. Birth Outcomes and Child Protective Services

Birth certificates, infant and fetal death certificates, and the Case and Management Information System (CAMIS) of the DSHS Division of Children and Family Services provided information on these measures.

Fetal Death Rate. Fetal deaths are identified on Fetal Death Certificates which are similar to Live Birth Certificates and are maintained by the Department of Health's Center for Health Statistics. Fetal death (stillbirth) is associated with pregnancies complicated by maternal medical conditions including substance abuse. Improvements in clinical management of the medical complications of pregnancy have contributed to reductions in fetal deaths. The fetal death rate is calculated as the number of fetal deaths divided by the total number of births.

Infant Mortality Rate. Information on infant deaths is collected by the Department of Health's Center for Health Statistics. Numerous and complex variables influence infant mortality including demographic, medical, physical, environmental, educational, behavioral, and attitudinal factors, as well as receipt of prenatal care. The infant death rate is calculated as the number of infant deaths in the year following birth divided by the total number of liveborn births. The infant mortality rate is often used as a standard measure of a population's health. Since information on infants who died in 1993 is not yet available, a full year had not yet elapsed for half of the infants in our sample (those born from January 1, 1992 through June 30, 1992) and the data which we present on this variable is

preliminary. In general, over 90% of all infant deaths occur in the first six months following birth.

Children's Protective Services. Out-of-home placements and accepted referrals with a high risk of imminent harm to the child are recorded in CAMIS by the Division of Children and Family Services. Referrals to Children's Protective Services (CPS) are evaluated using a risk assessment model focusing on parental ability to protect and care for their children. Parental substance abuse is included as a risk factor. CPS referrals are accepted for investigation only if they meet certain criteria, and the outcome of the investigation may be a case closure, a voluntary or court-ordered service plan, or an out-of-home placement. Out-of-home placements may occur on a voluntary basis while a woman receives substance abuse treatment.

Gestational Age. Information on gestational age was estimated by the physician and recorded on the birth certificate. The gestational age of a newborn infant is a measure of the maturity of the newborn at delivery. The expected duration of pregnancy is 40 weeks, and infants who are more than 37 weeks of gestation age are considered full-term. Infants born at 37 weeks or earlier are considered premature. Premature delivery is one of the two main causes for low birthweight.

Small for Gestational Age. This variable was calculated based on birth certificate information on gestational age and birthweight. For each week of gestation, there is a distribution of expected birthweights. If an infant fails to reach the tenth percentile in weight, given its gestational age, then it is considered to be small for gestational age (SGA). Poor maternal nutrition, birth defects, and placental problems are the main causes of intrauterine growth retardation (IUGR) which results in the infant being small for gestational age. IUGR is the second major cause of low birthweight.

Birthweight. The weight of the newborn child is recorded on the birth certificate. Birthweight is a primary indicator of the health of the newborn infant. Low birthweight is associated with increased risk of death and a wide range of disorders, including neuro-developmental conditions, learning disorders, behavior problems, and lower respiratory tract infections (*Healthy People 2000*, 1991). Newborn infants weighing less than 5.5 pounds (2500 grams) are considered low birthweight (LBW); those weighing less than 3.3 pounds (1500 grams) are considered very low birthweight (VLBW). The VLBW group is included within the LBW group. The rates of LBW and VLBW were calculated for singleton liveborn infants. Multiple births were excluded because they often have lower birthweights and a set of twins may unduly influence the rate of LBW in small groups.

5. Medical History

Medicaid claims provided the information for these tables.

Preterm labor. Preterm labor was identified by the ICD-9 diagnosis code 644.0 on Medicaid claims. Preterm labor may result in premature delivery of the newborn;

however, appropriate medical interventions may permit the pregnancy to continue to full term. The causes of preterm labor are not fully understood although infections, multiple gestation, and cocaine use are strongly associated with preterm labor and prematurity (Feldman et al., 1992; Garbaciak, 1992).

Trauma. Medical care for trauma was measured by the occurrence of diagnoses for injuries, fractures and burns (ICD-9 codes 800-959) on Medicaid claims. Substance abusers are at increased risk of unintentional injuries for a number of reasons, in particular poor coordination, inattentiveness to hazards, impaired judgment and domestic violence (Miller, 1990; Solomon and Malloy, 1992).

Emergency Services Use. Emergency services use was measured based on Medicaid claims where the provider was an Emergency Room Physician (Category of Service 29 or Provider Type 18). The use of emergency medical services may suggest poor health status, trauma episodes, or difficulty in accessing routine medical care.

Mental Health Disorders. Mental health problems occur with increased frequency among substance abusers and may be either a cause or a result of substance abuse. Persons with mental health problems may attempt to self-medicate with alcohol and illicit drugs. Prolonged substance abuse may result in personality changes and impaired brain function. The co-morbidity of substance abuse and mental health problems increases the difficulty of successful treatment (Fals-Stewart, 1994; Hesselbrock and Hesselbrock, 1993; McCown et al., 1994). Mental health disorders were identified using diagnoses on Medicaid claims. See Appendix F for a listing of the ICD-9 diagnoses used.

Length of Stay at Delivery. The length of the mother's hospital stay at delivery was determined from Medicaid claims for delivery hospitalizations.

Subsequent Delivery within Two Years. For women who retained Medicaid coverage, the First Steps Database contains information for two years after delivery. Subsequent deliveries were identified using hospital DRGs, ICD-9 and CPT codes on Medicaid claims.

6. Complications of Pregnancy, Labor and Delivery

Medicaid claims provided the information for these tables. Diagnoses pertaining to complications of pregnancy, labor, and delivery were grouped into fifteen major categories based on ICD-9 codes. A woman was counted in each major category in which one or more diagnostic codes within the range of codes for each group occurred in her claims history. The ICD-9 codes and categories are listed in Appendix G.

7. Medicaid Expenditures for Maternal Care

The total Medicaid payments reported here include all payments made by Medicaid for services during nine months of pregnancy and three months of postpartum care. Both inpatient and outpatient services are included, and many different types of payments are

represented: provider fees for prenatal care, delivery, and postpartum care; hospital charges for delivery services; enhanced prenatal services (MSS and MCM); and other medical ancillary services (such as transportation or dental care).

Total Medicaid payments for maternal care were divided into two major groups: payments for chemical dependency treatment and payments for all other medical care. The Medicaid reimbursement system records only some substance abuse treatment costs. Depending on the treatment modality and contractual arrangements with individual providers, payments for chemical dependency treatment may be reimbursed through Medicaid or through other DSHS payment systems (in particular SSPS). For pregnant women, Medicaid generally includes payments for detox, hospital-based intensive inpatient (including medical stabilization), and outpatient treatment. Payments for other types of residential treatment and free-standing intensive inpatient are not generally recorded in Medicaid and so are not included in payments for substance abuse treatment in this report.

8. Medicaid Expenditures for Infant Care

Medicaid payments for infant medical care are reported for the first year of the infant's life. Total expenditures are categorized as inpatient, inpatient related to Neonatal Intensive Care Unit (NICU), and outpatient. These analyses are limited to singleton liveborn infants whose mothers received Medicaid-paid maternity care.

LIMITATIONS

Many factors affect birth outcomes and medical expenditures, and the groups used in this report differ on characteristics other than substance abuse. Substance abuse is associated with a cluster of health and reproductive risk factors including cigarette smoking, poor prenatal and medical care, low income, mental illness, and single parenthood. Given this clustering of risk factors, substance abuse is not the only factor contributing to the group differences presented in this report and causal relationships cannot be imputed. The group of substance abusers first identified in the postpartum period faces a selection bias based on birth outcomes, for women with poor birth outcomes such as a low birthweight infant may be more likely to be screened for substance abuse than women who give birth to a healthy, full-term infant. The residential treatment groups have a different selection bias, for women referred to residential treatment rather than outpatient treatment have more medical risks and more serious substance abuse problems. Last, since this report relied on Medicaid claims and the receipt of publicly-funded substance abuse treatment for the identification of substance abusers, few women who did not receive Medicaid support for their maternity care could be identified as substance abusers.

Chapter One

Statewide Births: Substance Abuse and Birth Outcomes

This chapter compares the demographic characteristics, risk factors, prenatal care, and birth outcomes of women identified as substance abusers to all other women who gave birth in Washington State in the year July 1, 1991 through June 30, 1992. Since the identification of substance abuse in this study relied on Medicaid claims and on publicly-funded substance abuse treatment data, most of the identified substance abusers described in this study were women who qualified for Medicaid-paid maternity care. This is a significant limitation and it is therefore important to compare identified substance abusers to Medicaid women with no identified substance abuse problem as well as to non-Medicaid women.

The reduction of substance abuse among pregnant women can be accomplished either by reducing substance abuse among women prior to conception or by the early detection and treatment of substance abuse among pregnant women. This chapter examines the efficacy of treatment by comparing women who received prenatal substance abuse treatment to women who were identified in the prenatal period but did not receive prenatal treatment. A third group of substance abusers was identified in the postpartum period.

TARGET and the First Steps Database were used to identify substance abuse. TARGET was the primary source for data on whether a woman received publicly-funded substance abuse treatment. The First Steps Database contains information on substance abuse treatment as well as substance abuse medical diagnoses on Medicaid claims. The date of delivery from the First Steps Database was used to determine whether treatment began in the prenatal period or the year postpartum.

A total of 79,722 women gave birth in Washington State from July 1, 1991 through June 30, 1992. Women who received prenatal methadone treatment (n=87) and women whose prenatal substance abuse treatment records were incomplete (n=73) were excluded from these analyses. A description of the women receiving prenatal methadone treatment is contained in Appendix H. Of the remaining 79,562 women, 1,994 women (2.5%) were identified in either the prenatal period or the year following delivery as abusing substances. As discussed in the limitation section, our methods primarily identify substance abusers among women with Medicaid-paid maternity care.

For Medicaid women who gave birth in the year July 1, 1991 through June 30, 1992:

- 6.3% were identified as abusing drugs or alcohol either during their pregnancy or in the year following delivery (1,920÷30,330).
- 63% of diagnosed substance abusers were identified in the prenatal period (1,259÷1,920).
- 58% of substance abusers identified in the prenatal period received prenatal substance abuse treatment (730÷1,259).

Women who gave birth from July 1, 1991 through June 30, 1992 were assigned to one of five groups:

Identified Substance Abusers: Prenatal Substance Abuse Treatment. Women who received publicly-funded substance abuse treatment services in the prenatal period (N=730).

Identified Substance Abusers: Prenatal Substance Abuse Diagnosis. Women identified as substance abusers in the First Steps Database who did not receive publicly-funded substance abuse treatment services in the prenatal period (N=529).

Identified Substance Abusers: Postpartum Substance Abuse Diagnosis or Treatment. Women who were identified as substance abusers or received substance abuse treatment in the year following delivery and who were not identified or treated in the prenatal period (N=735).

Other Medicaid Women. Women with Medicaid payments for maternity services who were not identified as substance abusers (N=28,410).

Non-Medicaid Women. Women who were not identified as substance abusers and did not receive Medicaid payments for maternity services. (N=49,158).

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Table 1.1

DEMOGRAPHIC CHARACTERISTICS OF WOMEN GIVING BIRTH 7/1/91-6/30/92 BY SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS				
	Prenatal Substance Abuse Treatment (N=730)	Prenatal Substance Abuse Diagnosis (N=529)	Postpartum Substance Abuse Diagnosis or Treatment (N=735)	Other Medicaid (N=28,410)	Non-Medicaid (N=49,158)
Race					
White	515 (70.6%)	354 (66.9%)	497 (67.6%)	18,742 (66.0%)	42,316 (86.1%)
Hispanic	21 (2.9%)	19 (3.6%)	37 (5.0%)	5,025 (17.7%)	1,252 (2.6%)
Black	116 (15.9%)	76 (14.4%)	101 (13.7%)	1,410 (5.0%)	1,252 (2.6%)
Native American	64 (8.8%)	59 (11.2%)	64 (8.7%)	1,101 (3.9%)	410 (0.8%)
Asian	3 (0.4%)	4 (0.8%)	7 (1.0%)	1,478 (5.2%)	2,636 (5.4%)
Other or Unknown	11 (1.5%)	17 (3.2%)	29 (4.0%)	654 (2.3%)	1,292 (2.6%)
Age					
12-17	83 (11.4%)	45 (8.5%)	64 (8.7%)	2,428 (8.6%)	476 (1.0%)
18-19	68 (9.3%)	61 (11.5%)	79 (10.8%)	4,216 (14.8%)	1,117 (2.3%)
20-24	205 (28.1%)	202 (38.2%)	226 (30.8%)	10,880 (38.3%)	9,057 (18.4%)
25-29	200 (27.4%)	117 (22.1%)	193 (26.3%)	6,279 (22.1%)	16,775 (34.1%)
30-59	173 (23.7%)	102 (19.3%)	173 (23.5%)	4,584 (16.1%)	21,693 (44.1%)
Missing	1 (0.1%)	2 (0.4%)	0 (0.0%)	23 (0.1%)	40 (0.1%)
Average Age	24.9 yrs	24.3 yrs	24.9 yrs	23.8 yrs	28.8 yrs
Marital Status					
Married	184 (25.2%)	129 (24.4%)	171 (23.3%)	13,935 (49.1%)	45,072 (91.7%)
Single	542 (74.3%)	398 (75.2%)	561 (76.3%)	14,402 (50.7%)	3,997 (8.1%)
Unknown	4 (0.6%)	2 (0.4%)	3 (0.4%)	73 (0.3%)	89 (0.2%)
Number of Prior Children					
None	231 (31.6%)	197 (37.2%)	222 (30.2%)	12,060 (42.5%)	20,124 (40.9%)
One	179 (24.5%)	141 (26.7%)	198 (26.9%)	7,987 (28.1%)	17,594 (35.8%)
Two or More	316 (43.3%)	188 (35.5%)	313 (42.6%)	8,231 (29.0%)	11,128 (22.6%)
Unknown	4 (0.6%)	3 (0.6%)	2 (0.3%)	132 (0.5%)	312 (0.6%)

Table 1.1: FINDINGS

- The proportion of white women was approximately the same among identified substance abusers (66.9% to 70.6%) as among Medicaid women not identified as substance abusers (66.6%).

- The proportion of Hispanic women was much lower among identified substance abusers (less than 5%) than among Medicaid women not identified as substance abusers (almost 18%).

- The proportion of black women was much higher among identified substance abusers (13.7% to 15.9%) than among Medicaid women not identified as substance abusers (5.0%).

- The proportion of Native American women was much higher among identified substance abusers (8.7% to 11.2%) than among Medicaid women not identified as substance abusers (3.9%).

- The average age for women who received substance abuse treatment in the prenatal period (24.9 years) was greater than the average age for either women who were identified but not treated in the prenatal period (24.3 years) or Medicaid women not identified as substance abusers (23.8 years).

- Approximately 75% of women identified as substance abusers were unmarried, compared to about 50% of Medicaid women not identified as substance abusers and less than 10% of non-Medicaid women.

- About 40% of women identified as abusing substances already had two or more children compared to 30% for Medicaid women not identified as substance abusers and 23% for non-Medicaid women.

Table 1.2

RISK FACTORS, PRENATAL CARE AND MEDICAID ELIGIBILITY OF WOMEN GIVING BIRTH 7/1/91-6/30/92 BY SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS									
	Prenatal Substance Abuse Treatment (N=730)		Prenatal Substance Abuse Diagnosis (N=529)		Postpartum Substance Abuse Diagnosis or Treatment (N=735)		Other Medicaid (N=28,410)		Non-Medicaid (N=49,158)	
Trimester Prenatal Care Began										
First	417	(57.1%)	268	(50.7%)	366	(49.8%)	17,259	(60.7%)	41,696	(84.8%)
Second	202	(27.7%)	164	(31.0%)	181	(24.6%)	7,547	(26.6%)	4,530	(9.2%)
Third	43	(5.9%)	37	(7.0%)	69	(9.4%)	1,809	(6.4%)	635	(1.3%)
None	8	(1.1%)	10	(1.9%)	30	(4.1%)	230	(0.8%)	137	(0.3%)
Unknown	60	(8.2%)	50	(9.5%)	89	(12.1%)	1,565	(5.5%)	2,160	(4.4%)
Smoking Status										
Yes	432	(59.2%)	295	(55.8%)	439	(59.7%)	7,729	(27.2%)	5,599	(11.4%)
No	214	(29.3%)	134	(25.3%)	188	(25.6%)	18,340	(64.6%)	40,547	(82.5%)
Unknown	84	(11.5%)	100	(18.9%)	108	(14.7%)	2,341	(8.2%)	3,012	(6.1%)
Drugs of Choice										
Alcohol	483	(66.2%)	154	(29.1%)	393	(53.5%)				
Cocaine	267	(36.6%)	72	(13.6%)	216	(29.4%)				
Marijuana	150	(20.6%)	57	(10.8%)	122	(16.6%)				
Amphetamines	28	(3.8%)	7	(1.3%)	19	(2.6%)				
Heroin	43	(5.9%)	14	(2.7%)	91	(12.4%)				
Barbiturates	9	(1.2%)	3	(0.6%)	1	(0.1%)				
Other or Unspecified	37	(5.1%)	264	(49.9%)	145	(19.7%)				
Missing	37	(5.1%)	0	(0.0%)	1	(0.1%)				
Medicaid Eligibility										
Medicaid	699	(95.8%)	525	(99.2%)	696	(94.7%)	28,410	(100%)		
Non-Medicaid	31	(4.3%)	4	(0.8%)	39	(5.3%)			49,158	(100%)

Table 1.2: FINDINGS

- Among women with prenatal substance abuse treatment, the pro prenatal care (57%) was much higher than that among identified not receive prenatal substance abuse treatment (50% to 51%). (slightly lower than the proportion with first trimester prenatal ca women not identified as substance abusers (61%) and much low Medicaid women (85%).

- The rate of smoking among women identified as substance abus that for Medicaid women not identified as substance abusers (2' times the rate of smoking for non-Medicaid women (11%).

- Among substance abusing women with a known drug of choice approximately 30% abused cocaine, and about 20% abused mai

- Almost all of the women that could be identified for this study : 95%) had Medicaid coverage for their maternity medical care.

Table 1.2: FINDINGS

- Among women with prenatal substance abuse treatment, the proportion with first trimester prenatal care (57%) was much higher than that among identified substance abusers who did not receive prenatal substance abuse treatment (50% to 51%). On the other hand, it was slightly lower than the proportion with first trimester prenatal care among Medicaid women not identified as substance abusers (61%) and much lower than that for non-Medicaid women (85%).

- The rate of smoking among women identified as substance abusers was almost 60%, twice that for Medicaid women not identified as substance abusers (27%) and more than five times the rate of smoking for non-Medicaid women (11%).

- Among substance abusing women with a known drug of choice, over 50% abused alcohol, approximately 30% abused cocaine, and about 20% abused marijuana.

- Almost all of the women that could be identified for this study as substance abusers (over 95%) had Medicaid coverage for their maternity medical care.

Table 1.3

MEDICAID STATUS AND ENHANCED PRENATAL CARE AMONG MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92
BY SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS							
	Prenatal Substance Abuse Treatment (N=699)		Prenatal Substance Abuse Diagnosis (N=525)		Postpartum Substance Abuse Diagnosis or Treatment (N=696)		Other Medicaid (N=28,410)	
Medicaid Status								
Grant Recipients	544	(77.8%)	389	(74.1%)	542	(77.9%)	13,224	(46.5%)
Pre FS Medicaid Only	84	(12.0%)	72	(13.7%)	92	(13.2%)	6,298	(22.2%)
FS Expansion Group	59	(8.4%)	57	(10.9%)	52	(7.5%)	8,689	(30.6%)
Missing Eligibility	12	(1.7%)	7	(1.3%)	10	(1.4%)	199	(0.7%)
Received Maternity Support Services								
Yes	506	(72.4%)	353	(66.7%)	390	(53.1%)	15,674	(55.2%)
No	193	(27.6%)	172	(32.5%)	306	(41.6%)	12,736	(44.8%)
Received Maternity Case Management								
Yes	407	(58.2%)	227	(42.9%)	228	(31.0%)	5,126	(18.0%)
No	292	(41.8%)	298	(56.3%)	468	(63.7%)	23,284	(82.0%)

Table 1.3: FINDINGS

- Approximately 75% of substance abusing women who received Medicaid-paid maternity medical services also qualified for income assistance, while less than half (46.5%) of Medicaid women with no identified substance abuse problem received income assistance.

- About 10% of all women who received income assistance in addition to Medicaid maternity care were identified as substance abusers (1,475÷(1,475+13,224)). The proportion of identified substance abusers was much lower among women who qualified for Medicaid maternity care under criteria in effect prior to the 1989 expansion of Medicaid eligibility known as First Steps (3.8%=248÷(248+6,298)) and even lower among women who qualified for Medicaid under the First Steps expansion (1.9%=168÷(168+8,689)).

- Over 70% of Medicaid women with publicly-funded substance abuse treatment in the prenatal period received Maternity Support Services (MSS), slightly higher than that for women who were identified in the prenatal period but did not receive treatment (67%) or who were first identified as substance abusers in the postpartum period (53%). Among Medicaid women without an identified substance abuse problem, 55% received MSS in the prenatal period.

- Almost 60% of Medicaid women with substance abuse treatment in the prenatal period received Maternity Case Management (MCM) in the prenatal period, a much higher proportion than for women identified prenatally as abusing substance but who did not receive prenatal treatment services (43%) or who were identified as substance abusers in the postpartum period (31%). In contrast, only 18% of Medicaid women without an identified substance abuse problem received prenatal MCM.

Table 1.4

BIRTH OUTCOMES AND CHILD PROTECTIVE SERVICES FOR INFANTS BORN 7/1/91-6/30/92 BY MATERNAL SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS									
	Prenatal Substance Abuse Treatment (N=736)		Prenatal Substance Abuse Diagnosis (N=535)		Postpartum Substance Abuse Diagnosis or Treatment (N=746)		Other Medicaid (N=28,723)		Non-Medicaid (N=49,734)	
Fetal Deaths										
(per 1,000 births)	11	(14.9)	7	(13.1)	4	(5.4)	184	(6.4)	222	(4.5)
Infant Mortality (preliminary)										
(per 1,000 liveborn)	8	(11.0)	9	(17.0)	16	(21.6)	257	(9.0)	244	(4.9)
Child Protective Services										
Out-of-Home Placement	135	(18.3%)	73	(13.6%)	161	(21.6%)	544	(1.9%)	82	(0.2%)
Accepted Referral	328	(44.6%)	190	(35.5%)	386	(51.7%)	3,331	(11.6%)	865	(1.7%)
Gestational Age (singleton liveborn)										
Full-term (>37 wks)	601	(84.2%)	415	(80.0%)	550	(76.1%)	24,249	(86.8%)	43,232	(89.3%)
Premature (28-37 wks)	96	(13.5%)	94	(18.1%)	146	(20.2%)	3,055	(10.9%)	4,529	(9.4%)
Very Premature (< 28 wks)	4	(0.6%)	4	(0.8%)	10	(1.4%)	122	(0.4%)	144	(0.3%)
Unknown	13	(1.8%)	6	(1.2%)	17	(2.4%)	514	(1.8%)	488	(1.0%)
Small for Gestational Age (singleton liveborn)										
Yes	36	(5.0%)	32	(6.2%)	57	(7.9%)	757	(2.7%)	730	(1.5%)
No	673	(94.3%)	480	(92.5%)	654	(90.5%)	26,997	(96.6%)	47,385	(97.9%)
Unknown	5	(0.7%)	7	(1.4%)	12	(1.7%)	186	(0.7%)	278	(0.6%)
Birthweight (singleton liveborn)										
Very Low Birthweight (under 1500 grams)	9	(1.3%)	5	(1.0%)	10	(1.4%)	211	(0.8%)	245	(0.5%)
Low Birthweight (under 2500 grams)	68	(9.6%)	67	(13.0%)	105	(14.7%)	1,466	(5.3%)	1,607	(3.3%)

Table 1.4: FINDINGS

- Fetal death rates were higher among women identified as substance abusers in the prenatal period (14.9 or 13.1 per 1,000 births) than among Medicaid women not identified as abusing substances (6.4 per 1,000) or non-Medicaid women (4.5 per 1,000).

- Preliminary Infant Mortality Rates for children born to identified substance abusers (11.0 to 21.6 per 1,000) were higher than that for infants born to Medicaid women not identified as abusing substances (9.0 per 1,000) or non-Medicaid women (4.9 per 1,000).

- Out-of-home placements occurred for 13.6% to 21.6% of infants born to substance abusing women. These rates were over seven times that for infants born to Medicaid women not identified as abusing substances (1.9%) and over fifty times the rate of out-of-home placements for infants born to non-Medicaid women (0.2%). (Over 90% of placements lasted more than 60 days and over half had no end date in CAMIS.)

- Over one-third (35.5%) to one-half (51.7%) of infants born to substance abusing women were reported as at high risk of imminent harm in accepted referrals for child abuse or neglect to Child Protective Services. These rates were over three times greater than the rate of accepted referrals for infants born to Medicaid women not identified as abusing substances (11.6%) and over twenty times greater than the rate of accepted referrals for infants born to non-Medicaid women (1.7%).

- Among all infants born in the study year who were placed outside the home, 37% were the children of women identified as abusing substances. Among all infants born in the study year with accepted referrals to Child Protective Services, 18% were children of identified substance abusers substances. Only 2.5% of births were to identified substance abusers.

- Singleton infants born to women who received substance abuse treatment in the prenatal period were slightly less likely to be full-term (84%) than the infants born to Medicaid women not identified as abusing substances (87%). In contrast, only 80% of singleton infants born to women identified but not treated in the prenatal period were full-term, and 76% of infants born to women first identified in the postpartum period were full-term.

- The proportion of singleton infants that were small for gestational age among substance abusing women (5.0% to 7.9%) was twice that for infants of Medicaid women not identified as abusing substances (2.7%) and over three times that for infants of non-Medicaid women (1.5%).

- The rate of low birthweight (less than 2500 grams, or 5.5 pounds) for singleton liveborn infants was lower for women who received prenatal substance abuse treatment (9.6%) than for substance abusers identified but not treated in the prenatal period (13.0%) and women first identified in the postpartum period (14.7%). Low birthweight rates for all three groups of identified substance abusers were substantially higher than those for Medicaid women not identified as abusing substances (5.3%) or non-Medicaid women (3.3%).

Table 1.5

MEDICAL HISTORY OF MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS							
	Prenatal Substance Abuse Treatment (N=699)		Prenatal Substance Abuse Diagnosis (N=525)		Postpartum Substance Abuse Diagnosis or Treatment (N=696)		Other Medicaid (N=28,410)	
Preterm Labor								
Yes	134	(19.2%)	126	(24.0%)	122	(17.5%)	3,842	(13.5%)
No	565	(80.8%)	399	(76.0%)	574	(82.5%)	24,568	(86.5%)
Prenatal Injuries or Fractures								
Yes	102	(14.6%)	76	(14.5%)	96	(13.8%)	2,642	(9.3%)
No	597	(85.4%)	449	(85.5%)	600	(86.2%)	25,768	(90.7%)
Prenatal Emergency Services Use								
Yes	334	(47.8%)	252	(48.0%)	274	(39.4%)	7,641	(26.9%)
No	365	(52.2%)	273	(52.0%)	422	(60.6%)	20,769	(73.1%)
Prenatal Mental Health Diagnoses								
Neurotic Disorders	36	(5.2%)	25	(4.8%)	14	(2.0%)	319	(1.1%)
Affective Psychoses	29	(4.2%)	16	(3.1%)	12	(1.7%)	159	(0.6%)
Depressive Disorders	18	(2.6%)	4	(0.8%)	10	(1.4%)	89	(0.3%)
Personality Disorders	15	(2.2%)	5	(1.0%)	5	(0.7%)	57	(0.2%)
Schizophrenic Disorders	8	(1.1%)	7	(1.3%)	4	(0.6%)	40	(0.1%)
Other Mental Disorders	3	(0.4%)	4	(0.8%)	4	(0.6%)	14	(0.1%)
Any of the Above:	81	(11.6%)	43	(8.2%)	35	(5.0%)	574	(2.0%)
Average Length of Delivery Stay	3.8 days		4.0 days		3.7 days		3.3 days	
Subsequent Delivery Within Two Years								
Yes	84	(12.0%)	84	(16.0%)	138	(19.8%)	3,614	(12.7%)
No	615	(88.0%)	441	(84.0%)	558	(80.2%)	24,796	(87.3%)

Table 1.5: FINDINGS

- The proportion of women with a diagnosis of preterm labor was substantially higher among identified substance abusers (17.5% to 24.0%) than among Medicaid women with no identified substance abuse problem (13.5%).

- About 14% of identified substance abusers experienced injuries or fractures in the prenatal period; the proportion for Medicaid women with no identified substance abuse problem was 9.3%.

- Among women with prenatal substance abuse treatment, 11.6% received a diagnosis of some mental disorder compared to 8.2% for women with a prenatal substance abuse diagnoses but no prenatal treatment and 5.0% for women with postpartum identification of substance abuse. The rates of diagnosis for mental disorder for all three groups of identified substance abusers were substantially higher than those for Medicaid women not identified as abusing substances (2.0%). The most common diagnoses among women with prenatal substance abuse treatment were neurotic disorders (5.2%), affective psychoses (4.2%), depressive disorders (2.6%), and personality disorders (2.2%).

- Almost 50% of Medicaid women identified as substance abusers in the prenatal period used Emergency Services in the prenatal period, compared to 39% for women identified as substance abusers in the postpartum period and 27% for Medicaid women with no identified substance abuse problem.

- The average length of hospital stay at the time of delivery was slightly higher for identified substance abusers (3.7 to 4.0 days) than for other Medicaid women (3.3 days).

- The proportion of women with a subsequent Medicaid-paid delivery within two years was the same for women who received prenatal substance abuse treatment (12.0%) as for Medicaid women with no identified substance abuse problem (12.7%). Among identified substance abusers who did not receive prenatal substance abuse treatment, a higher proportion had a subsequent Medicaid-paid delivery within two years (16.0% to 19.8%).

Table 1.6

COMPLICATIONS OF PREGNANCY, LABOR AND DELIVERY AMONG MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS							
	Prenatal Substance Abuse Treatment (N=699)		Prenatal Substance Abuse Diagnosis (N=525)		Postpartum Substance Abuse Diagnosis or Treatment (N=696)		Other Medicaid (N=28,410)	
Categories Including Drug Diagnoses								
Other Current Conditions	461	(66.0%)	433	(82.5%)	433	(62.2%)	8043	(28.3%)
Fetal Abnormality	85	(12.2%)	49	(9.3%)	62	(8.9%)	1538	(5.4%)
Medical Complications								
Other Complications of Pregnancy	254	(36.3%)	217	(41.3%)	219	(31.5%)	6473	(22.8%)
Other Fetal or Placental Problems	275	(39.3%)	219	(41.7%)	237	(34.0%)	9168	(32.3%)
Indications for Interventions	89	(12.7%)	62	(11.8%)	86	(12.4%)	2982	(10.5%)
PROM Less than 24 hrs	43	(6.2%)	31	(5.9%)	47	(6.8%)	1307	(4.6%)
PROM More than 24 hrs	26	(3.7%)	30	(5.7%)	22	(3.2%)	777	(2.7%)
Obstetric Complications (Related to Fetal Size)								
Disproportion	36	(5.2%)	30	(5.7%)	28	(4.0%)	2088	(7.4%)
Obstructed Labor	47	(6.7%)	46	(8.8%)	30	(4.3%)	2493	(8.8%)
Lacerations	162	(23.2%)	125	(23.8%)	191	(27.4%)	8476	(29.8%)
Structural Complications (Independent of Fetal Size)								
Malposition; Breech Extraction	69	(9.9%)	50	(9.5%)	65	(9.3%)	2553	(9.0%)
Umbilical Cord Complications	132	(18.9%)	96	(18.3%)	159	(22.8%)	5289	(18.6%)
Other Complications								
Abnormality of Labor	102	(14.6%)	60	(11.4%)	94	(13.5%)	3562	(12.5%)
Long Labor	26	(3.7%)	33	(6.3%)	22	(3.2%)	1246	(4.4%)
Obstetrical Trauma	35	(5.0%)	37	(7.0%)	51	(7.3%)	1288	(4.5%)

Table 1.6: FINDINGS

- The diagnostic categories Other Current [Maternal] Conditions (ICD-9 648) and Fetal Abnormality (ICD-9 655) include some diagnostic codes used to identify substance abuse. This explains the very high proportion of substance abusers with diagnoses in Other Current Conditions, up to 82.5% of the prenatal diagnosed group. Compared to pregnant women, many fewer fetuses are identified as being affected by substance abuse: while 5.4% of fetuses of other Medicaid women were diagnosed with a fetal abnormality not related to substance abuse, 8.9% to 12.2% of fetuses of substance abusers were diagnosed as being affected by substance abuse or having another fetal abnormality.

- Other Fetal or Placental Problems were diagnosed with greater frequency among substance abusers with prenatal diagnosis or treatment (41.7% and 39.3%, respectively) compared to women with postpartum diagnosis or treatment (34.0%) and other Medicaid women (32.3%). This may reflect increased opportunity for medical providers to make these diagnoses for the first two groups and their heightened sensitivity to the risks of fetal problems for substance abusers. (The category Other Fetal or Placental Problems (ICD-9 656) includes fetal distress, poor fetal growth, excessive fetal growth, abnormal placenta, fetal-maternal hemorrhage, Rh and other blood group incompatibility, intrauterine death, and other specified and unspecified fetal and placental problems.)

- The rate of Other Complications of Pregnancy among substance abusers (31.5% to 41.3%) was substantially greater than the rate of among other Medicaid women (22.8%). (The category Other Complications of Pregnancy (ICD-9 646) includes kidney disease, liver disorders, infections of genitourinary tract, edema, excessive weight gain, peripheral neuritis, and other specified and unspecified complications.)

- Obstetric complications related to the size of the fetus tended to occur less frequently among substance abusers compared to other Medicaid women. A likely explanation for these findings is the higher rate low birthweight babies born to substance abusers.

MEDICAID EXPENDITURES FOR MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY SUBSTANCE ABUSE AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS											
	Prenatal Substance Abuse Treatment (N=699)			**Prenatal Substance Abuse Diagnosis (N=525)**			**Postpartum Substance Abuse Diagnosis or Treatment (N=696)**			**Other Medicaid (N=28,410)**		
	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment
Prenatal Period												
Inpatient	125	$3,069	$549	107	$2,933	$598	55	$1,944	$154	1,886	$2,208	$147
Prenatal Outpatient	676	1,251	1,209	516	1,309	1,287	664	1,111	1,059	27,048	973	926
Other Outpatient	681	465	453	505	404	389	647	357	332	25,505	248	223
MSS and MCM	553	534	422	381	427	310	424	338	206	16,158	290	165
Subtotal:			$2,634			$2,584			$1,750			$1,460
Delivery and Postpartum												
Delivery	661	$2,785	$2,634	512	$3,011	$2,937	670	$2,682	$2,582	26,609	$2,446	$2,291
Other Inpatient	24	3,755	129	25	2,753	131	20	2,978	86	691	2,965	72
Outpatient	528	328	247	397	312	236	472	334	226	20,186	240	171
MSS and MCM	447	283	181	333	256	162	377	254	138	12,059	194	82
Subtotal:			$3,191			$3,466			$3,031			$2,616
Medical Care Payments:			**$5,825**			**$6,049**			**$4,782**			**$4,076**
Substance Abuse Treatment (includes assessment and detox)												
Prenatal Inpatient	205	$4,600	$1,349	2	$1,271	$5	0	$0	$0			
Postpartum Inpatient	21	2,894	87	3	5,156	29	2	2,605	7			
Prenatal Outpatient	511	429	314	156	82	24	0	0	0			
Postpartum Outpatient	262	228	85	49	214	20	105	222	33			
Substance Abuse Payments:	**567**	**$2,262**	**$1,835**	**188**	**$220**	**$79**	**107**	**$266**	**$41**			
Total Payments For Maternal Care:			**$7,661**			**$6,128**			**$4,822**			**$4,076**

Table 1.7: FINDINGS

- The average Medicaid payment for substance abuse treatment for women with Medicaid-paid substance abuse treatment in the prenatal period was $2,262. The average Medicaid expenditure for hospital-based prenatal substance abuse treatment ($4,600) was ten times the average Medicaid expenditure for outpatient substance abuse treatment in the prenatal period ($429). Most of the women with hospital-based treatment were medically high risk pregnant women who were admitted for medical stabilization. (These amounts exclude DASA payments made through reimbursement systems other than Medicaid.)

- The average Medicaid payment (excluding substance abuse treatment) for maternal medical care among women identified as substance abusers in the prenatal period ($5,825 to $6,049) was higher than that for women first identified in the postpartum period ($4,782) or for Medicaid women with no identified substance abuse problem ($4,076).

- Medicaid payments in the prenatal period were higher in all four categories of medical care among Medicaid women identified during pregnancy with a substance abuse problem compared to Medicaid women with no identified substance abuse problem: inpatient payments were three times higher ($549 to $598 versus $147); prenatal outpatient payments were $250 higher ($1,209 to $1,287 versus $926); other outpatient payments were almost twice as high ($389 to $453 versus $223); and payments for enhanced prenatal care services were about twice as high ($310 to $422 versus $165).

- The average Medicaid expenditure for prenatal Maternity Support Services (MSS) and Maternity Case Management (MCM) was higher for women with prenatal substance abuse treatment ($422) than for other identified substance abusers ($206 to $310) or Medicaid women not identified as abusing substances ($165).

- Almost 20% of Medicaid women identified in the prenatal period as abusing substances had a hospitalization in the prenatal period which did not involve substance abuse treatment (125÷699 = 17.9%; 107÷525 = 20.4%), a rate of prenatal hospitalization substantially higher than that for women first identified as abusing substances in the postpartum period (55÷696 = 7.9%) or for Medicaid women with no identified substance abuse problem (1,886÷28,410 = 6.6%).

Notes for Table 1.7:

Users: The number of persons with Medicaid expenditures for that type of service. For example, 125 women in the prenatal substance abuse treatment group had inpatient expenditures in the prenatal period.

Users Average Payment: The average Medicaid expenditure calculated for persons with expenditures for that type of service. For example, the average Medicaid expenditure for the 125 women in the prenatal substance abuse treatment group who had inpatient expenditures in the prenatal period was $3,069 (125 x $3,068.89 = $383,611).

Group Average Payment: The average Medicaid expenditure calculated for all persons in the group. For example, the average Medicaid expenditure for prenatal inpatient events for the 699 Medicaid women in the prenatal substance abuse treatment group was $549 (699 x $548.80 = $383,611).

Table 1.8

MEDICAID EXPENDITURES FOR INFANTS OF MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY MATERNAL SUBSTANCE ABUSE STATUS AND TREATMENT

	IDENTIFIED SUBSTANCE ABUSERS											
	Prenatal Substance Abuse Treatment (N=676)			**Prenatal Substance Abuse Diagnosis (N=509)**			**Postpartum Substance Abuse Diagnosis or Treatment (N=677)**			**Other Medicaid (N=27,422)**		
	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment
Payments for Infant Care (first year of life, singleton liveborn only)												
Inpatient (non NICU)	584	$1,964	$1,697	451	$1,679	$1,488	598	$2,035	$1,798	24,687	$1,256	$1,131
Inpatient NICU	71	15,177	1,594	58	16,711	1,904	84	11,556	1,434	1,622	16,026	948
Outpatient	644	959	914	484	1,023	973	642	851	807	25,935	737	697
Total Payments For Infant Care:			**$4,205**			**$4,364**			**$4,039**			**$2,776**

Table 1.8: FINDINGS

- The average Medicaid expenditure for infant care during the first year of life for infants born to women identified as abusing substances ($4,039 to $4,364) was 1.5 times that for the infants of Medicaid women with no identified substance abuse problem ($2,776).

- Almost twice as many of the singleton infants born to Medicaid women identified as abusing substances spent time in a hospital Neonatal Intensive Care Unit (71÷676 = 10.5%; 58÷509 = 11.4%; 84÷677 = 12.4%) as did infants born to Medicaid women with no identified substance abuse problem (1,622÷27,422 = 5.9%).

Notes for Table 1.8:

Users: The number of infants with Medicaid expenditures for that type of service. For example, for singleton infants born to women with prenatal substance abuse treatment, 584 had non-NICU inpatient expenditures in their first year of life.

Users Average Payment: The average Medicaid expenditure calculated for infants with expenditures for that type of service. For example, for singleton infants born to women with prenatal substance abuse treatment, the average Medicaid expenditure for the 584 infants who had non-NICU inpatient expenditures in their first year of life was $1,964 (584 x $1,964.42 = $1,147,221).

Group Average Payment: The average Medicaid expenditure calculated for all infants born to women in the group. For example, for the 676 singleton infants born to women with prenatal substance abuse treatment, the average Medicaid expenditure for non-NICU inpatient events was $1,697 (676 x $1,697.07 = $1,147,219).

Discussion

This chapter examined the demographic characteristics, risk factors, birth outcomes and Medicaid expenses for women identified as substance abusers. Since the identification of substance abuse relied on Medicaid claims and other data on publicly-funded substance abuse treatment, most of the identified substance abusers were women who qualified for Medicaid-paid maternity care.

Identified substance abusers have many high risk characteristics in addition to substance abuse which are associated with adverse birth outcomes. Compared to other Medicaid women and non-Medicaid women, identified substance abusers are much more likely to be single and to be poor enough to qualify for income assistance. They have both reproductive risk factors (including high rates of smoking and preterm labor) and medical problems (including prenatal injuries or fractures, prenatal mental health diagnoses, and prenatal hospitalizations) associated with high medical costs and poor birth outcomes. As is appropriate given their characteristics, a high proportion of substance abusers receive Maternity Support and Case Management Services. Medicaid expenditures for medical care are substantially higher among substance abusers than for other Medicaid women, particularly if they are identified in the prenatal period. This finding is consistent with the health care needs and medical problems observed among substance abusers. Among women with prenatal substance abuse treatment, substance abuse treatment represents about 24% of Medicaid expenditures for maternal care in the prenatal and immediate postpartum period.

Many factors indicate that the children born to identified substance abusers are disadvantaged. They are more likely to be premature, to be small for their gestational age, to be low birthweight at the time of birth, to die in the first year of life, to be referred to Child Protective Services, to be placed outside the home and to have high medical expenses in their first year of life. The study findings indicate that prenatal substance abuse treatment ameliorates the relationship between poor birth outcomes and substance abuse. Compared to women identified but not treated in the prenatal period, children born to women with prenatal substance abuse treatment are more likely to be full-term, to be normal birthweight, and to develop adequately in utero. These findings offer evidence that prenatal substance abuse treatment improves infant health.

The high rate of out-of-home placement and referrals for children born to substance abusing women suggests the need for further study. Over 90% of the placements were for more than 60 days and more than half of the placements had no end date recorded in CAMIS. These data underscore the importance of providing parenting and child care support to substance abusing women. Over two-thirds of these women already have children, and the provision of those services should begin in the prenatal period.

Chapter Two

Prenatal Substance Abuse Treatment Modalities and Birth Outcomes

This chapter examines the characteristics and birth outcomes of women who received prenatal substance abuse treatment. A broad range of women enter substance abuse treatment, from women entering treatment for the first time and having a substance abuse problem in its early stages to women who have been in treatment before and have a long-term substance abuse problem. The type of treatment which a woman receives can also range from a few days of outpatient treatment to an extensive course of hospital-based or freestanding (non-hospital based) intensive inpatient, residential recovery house or long-term care, and outpatient treatment. This chapter examines the characteristics and outcomes of women who received minimal treatment compared to women with substantial amounts of substance abuse treatment and the different characteristics and birth outcomes for women with varying combinations of residential and outpatient treatment.

A full continuum of treatment services is available to pregnant women in Washington including hospital-based detoxification, medical stabilization and intensive inpatient treatment; freestanding intensive inpatient treatment; long-term residential treatment, extended care recovery house, and transitional housing for women and their children; and intensive outpatient and outpatient treatment. Specialized programs have been established to address the special needs associated with pregnant and parenting women and referrals are made to these programs whenever possible. Pregnant women are usually referred to treatment after assessment at an ADATSA Assessment Center using standardized procedures and taking into account the gestational age of the fetus, mother's age, environment, and family support. The Division of Alcohol and Substance Abuse (DASA) recommends that all pregnant women in need of intensive inpatient treatment be referred to hospital-based treatment in order to assure medical stabilization of the fetus. They also recommend that women using cocaine in any stage of pregnancy or actively abusing alcohol or illicit drugs in the last trimester of their pregnancy be given priority for placement in hospital-based inpatient treatment. Outpatient treatment, either intensive outpatient or outpatient treatment, is appropriate for pregnant women with social supports, judged able to maintain sobriety with outpatient services, or unwilling to accept residential or inpatient treatment. (See Washington State DASA, *Treatment Protocol for Chemical-Using Pregnant Women,* 1993, for more detail.)

The 730 women identified in the previous chapter as receiving substance abuse treatment in the prenatal period were divided into groups based on the type and quantity of prenatal treatment received. Fourteen women included in the prenatal treatment group for the statewide analysis were dropped from this analysis because they had treatment episodes which could not be linked to definite durations. The remaining 716 women who gave birth in the year July 1, 1991 through June 30, 1992 were linked to substance abuse treatment reported on Medicaid claims using the First Steps Database maintained by the Office of Research and Data Analysis or on records in the TARGET database maintained by DASA.

Four groups were defined based on the type and amount of substance abuse treatment received. Intensive outpatient and outpatient treatment were combined into an outpatient treatment category. Four residential-based treatment modalities were combined into a residential treatment category: hospital-based intensive inpatient treatment, freestanding intensive inpatient treatment, recovery house, and long-term residential. The thresholds used to delineate groups were 18 days for outpatient and 7 days for residential and were established by empirical data review. Treatment data came from TARGET and the First Steps Database using procedures described in Appendices A through C. The groups were defined as follows:

Minimal Treatment -- women with less than 18 days of outpatient substance abuse treatment and less than 7 days of residential treatment (N=130).

Outpatient Treatment Only -- women with at least 18 days of outpatient substance abuse treatment and less than 7 days of residential treatment (N=358).

Residential and Outpatient Treatment -- women with at least 18 days of outpatient substance abuse treatment and at least 7 days of residential treatment (N=99).

Residential Treatment Only -- women with less than 18 days of outpatient substance abuse treatment and at least 7 days of residential treatment (N=129).

Of the 716 women with prenatal substance abuse treatment of known duration, 50% were in the Outpatient Only group, 18% were in the Residential Only group, 18% were in the Minimal Treatment group, and 14% were in the Residential and Outpatient group. The following table gives the average number of outpatient and residential days for each of these four groups.

Duration of Outpatient and Residential Treatment by Prenatal Substance Abuse Treatment Group

Treatment Group	Average Days of Outpatient Treatment	Average Days of Residential Treatment
Minimal Treatment	4.8 days	0.7 days
Outpatient Treatment Only	124.9 days	0.1 days
Residential and Outpatient Treatment	104.6 days	33.6 days
Residential Treatment Only	1.5 days	41.9 days

The next table presents information on the type and duration of residential treatment (hospital-based and freestanding residential) which women in the residential treatment groups received. Since a woman may receive both hospital-based and freestanding residential treatment, the same woman may be counted twice. (For example, 75+25=100 so one woman in the Residential and Outpatient Treatment Group received both hospital-based and freestanding residential treatment.)

Type and Duration of Residential Treatment For Residential Treatment Groups

	Residential and Outpatient Treatment (N=99)	Residential Treatment Only (N=129)
Average Number of Hospital-Based Days	20.7 days	16.5 days
Number of Women with Hospital-Based Treatment	75	90
Average Number of Freestanding Residential Days	12.9 days	25.4 days
Number of Women with Freestanding Residential Days	25	42

Table 2.1

DEMOGRAPHIC CHARACTERISTICS OF WOMEN GIVING BIRTH 7/1/91-6/30/92 BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=130)	Outpatient Treatment Only (N=358)	Residential and Outpatient Treatment (N=99)	Residential Treatment Only (N=129)
Race				
White	84 (64.6%)	284 (79.3%)	73 (73.7%)	64 (49.6%)
Hispanic	8 (6.2%)	8 (2.2%)	0 (0.0%)	5 (3.9%)
Black	24 (18.5%)	34 (9.5%)	14 (14.1%)	43 (33.3%)
Native American	11 (8.5%)	26 (7.3%)	9 (9.1%)	15 (11.6%)
Asian	1 (0.8%)	2 (0.6%)	0 (0.0%)	0 (0.0%)
Other or Unknown	2 (1.5%)	4 (1.1%)	3 (3.0%)	2 (1.6%)
Age				
12-17	21 (16.2%)	48 (13.4%)	3 (3.0%)	9 (7.0%)
18-19	13 (10.0%)	37 (10.3%)	7 (7.1%)	8 (6.2%)
20-24	46 (35.4%)	80 (22.3%)	33 (33.3%)	42 (32.6%)
25-29	23 (17.7%)	102 (28.5%)	30 (30.3%)	42 (32.6%)
30-59	27 (20.8%)	90 (25.1%)	26 (26.3%)	28 (21.7%)
Missing	0 (0.0%)	1 (0.3%)	0 (0.0%)	0 (0.0%)
Average Age	24.0 yrs	24.8 yrs	25.9 yrs	25.6 yrs
Marital Status				
Married	34 (26.2%)	106 (29.6%)	18 (18.2%)	25 (19.4%)
Single	94 (72.3%)	252 (70.4%)	80 (80.8%)	103 (79.8%)
Unknown	2 (1.5%)	0 (0.0%)	1 (1.0%)	1 (0.8%)
Number of Prior Children				
None	37 (28.5%)	133 (37.2%)	22 (22.2%)	35 (27.1%)
One	36 (27.7%)	80 (22.3%)	21 (21.2%)	37 (28.7%)
Two or More	56 (43.1%)	143 (39.9%)	56 (56.6%)	56 (43.4%)
Unknown	1 (0.8%)	2 (0.6%)	0 (0.0%)	1 (0.8%)

Table 2.1: FINDINGS

- A higher proportion of women who received at least 18 days of outpatient treatment were white (74% to 79%) compared to women who received minimal treatment (65%) or only residential treatment (50%).

- Among women who received residential treatment, 53% (73÷(73+64)) of white women also received outpatient treatment compared to only 25% (14÷(14+43)) of black women.

- The average age for women who received minimal treatment (24.0 years) was lower than that for women receiving only outpatient treatment (24.8 years), and both of these groups were younger than women receiving residential substance abuse treatment (25.6 to 25.9 years).

- A slightly higher proportion of women were married in the outpatient treatment only group (30%) than in the minimal treatment group (26%), and a higher proportion of women in both these groups were married than in the two residential groups (18% to 19%).

- The proportion of women with no prior children was substantially higher in the outpatient only group (37%) than in the other three groups (minimal treatment, 29%; residential only, 27%; and residential and outpatient, 22%).

Table 2.2

RISK FACTORS, PRENATAL CARE AND MEDICAID ELIGIBILITY OF WOMEN GIVING BIRTH 7/1/91-6/30/92
BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=130)		Outpatient Treatment Only (N=358)		Residential and Outpatient Treatment (N=99)		Residential Treatment Only (N=129)	
Trimester Prenatal Care Began								
First	63	(48.5%)	224	(62.6%)	63	(63.6%)	57	(44.2%)
Second	37	(28.5%)	94	(26.3%)	26	(26.3%)	42	(32.6%)
Third	13	(10.0%)	17	(4.7%)	2	(2.0%)	11	(8.5%)
None	5	(3.8%)	2	(0.6%)	0	(0.0%)	1	(0.8%)
Unknown	12	(9.2%)	21	(5.9%)	8	(8.1%)	18	(14.0%)
Smoking Status								
Yes	77	(59.2%)	199	(55.6%)	72	(72.7%)	76	(58.9%)
No	34	(26.2%)	123	(34.4%)	22	(22.2%)	29	(22.5%)
Unknown	19	(14.6%)	36	(10.1%)	5	(5.1%)	24	(18.6%)
Drugs of Choice								
Alcohol	80	(61.5%)	229	(64.0%)	80	(80.8%)	87	(67.4%)
Cocaine	46	(35.4%)	62	(17.3%)	62	(62.6%)	90	(69.8%)
Marijuana	22	(16.9%)	53	(14.8%)	36	(36.4%)	37	(28.7%)
Amphetamines	6	(4.6%)	14	(3.9%)	6	(6.1%)	2	(1.6%)
Heroin	5	(3.9%)	13	(3.6%)	10	(10.1%)	14	(10.9%)
Barbiturates	1	(0.8%)	3	(0.8%)	2	(2.0%)	3	(2.3%)
Other or Unspecified	8	(6.2%)	28	(7.8%)	0	(0.0%)	0	(0.0%)
Missing	6	(4.6%)	29	(8.1%)	0	(0.0%)	2	(1.5%)
Medicaid Eligibility								
Medicaid	122	(93.8%)	336	(93.9%)	99	(100%)	129	(100%)
Non-Medicaid	8	(6.2%)	22	(6.1%)	0	(0.0%)	0	(0.0%)

Table 2.2: FINDINGS

- Among women who received outpatient substance abuse treatment, over 60% began prenatal care in the first trimester (63% for outpatient only group and 64% for residential and outpatient group). In contrast, less than half of the women in the other two groups began prenatal care in their first trimester (49% for women with minimal treatment and 44% for women with residential only).

- More than 60% of women in the two residential groups used cocaine, a higher proportion than that for women with minimal treatment (35%) or women with outpatient treatment only (17%). Women in the residential treatment groups also had high rates of marijuana (30%), alcohol (67% to 81%) and heroin use (10%).

- Women with only outpatient treatment predominantly abused alcohol, with 64% abusing alcohol and less than 20% abusing cocaine or marijuana.

Table 2.3

MEDICAID STATUS AND ENHANCED PRENATAL CARE AMONG MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92
BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=122)		Outpatient Treatment Only (N=336)		Residential and Outpatient Treatment (N=99)		Residential Treatment Only (N=129)	
Medicaid Status								
Grant Recipients	103	(84.4%)	236	(70.2%)	86	(86.9%)	109	(84.5%)
Pre FS Medicaid Only	5	(4.1%)	47	(14.0%)	3	(3.0%)	3	(2.3%)
FS Expansion Group	12	(9.8%)	46	(13.7%)	10	(10.1%)	14	(10.9%)
Missing Eligibility	2	(1.6%)	7	(2.1%)	0	(0.0%)	3	(2.3%)
Received Maternity Support Services								
Yes	87	(71.3%)	235	(69.9%)	79	(79.8%)	95	(73.6%)
No	35	(28.7%)	101	(30.1%)	20	(20.2%)	34	(26.4%)
Received Maternity Case Management								
Yes	65	(53.3%)	183	(54.5%)	70	(70.7%)	78	(60.5%)
No	57	(46.7%)	153	(45.5%)	29	(29.3%)	51	(39.5%)

Table 2.3: FINDINGS

- The proportion of Grant Recipients was lower among Medicaid women with only outpatient treatment (70%) than among Medicaid women in the other treatment groups (84% to 87%).

- At least 70% of Medicaid women in all four substance abuse treatment groups received Maternity Support Services.

- A higher proportion of women with residential treatment (61% to 71%) received Maternity Case Management in the prenatal period than among women who received minimal treatment or outpatient treatment only (53% to 54%).

Table 2.4

BIRTH OUTCOMES AND CHILD PROTECTIVE SERVICES FOR INFANTS BORN 7/1/91-6/30/92 BY MATERNAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=132)		Outpatient Treatment Only (N=361)		Residential and Outpatient Treatment (N=100)		Residential Treatment Only (N= 129)	
Fetal Deaths								
(per 1,000 births)	4	(30.3)	4	(11.1)	1	(10.0)	2	(15.5)
Infant Mortality (preliminary)								
(per 1,000 liveborn)	2	(15.2)	3	(8.3)	2	(20.2)	1	(7.8)
Child Protective Services								
Out-of-Home Placement	23	(17.4%)	52	(14.4%)	23	(23.0%)	35	(27.1%)
Accepted Referral	56	(42.4%)	132	(36.6%)	58	(58.0%)	74	(57.4%)
Gestational Age								
(singleton liveborn)								
Full-Term (> 37 wks)	104	(83.2%)	299	(85.2%)	84	(86.6%)	101	(79.5%)
Premature (28 - 37 wks)	16	(12.8%)	44	(12.5%)	12	(12.4%)	23	(18.1%)
Very Premature (< 28 wks)	0	(0.0%)	3	(0.9%)	1	(1.0%)	0	(0.0%)
Unknown	5	(4.0%)	5	(1.4%)	0	(0.0%)	3	(2.4%)
Small for Gestational Age								
(singleton liveborn)								
Yes	8	(6.4%)	15	(4.3%)	4	(4.1%)	9	(7.1%)
No	115	(92.0%)	333	(94.9%)	93	(95.9%)	18	(92.9%)
Unknown	2	(1.6%)	3	(0.9%)	0	(0.0%)	0	(0.0%)
Birthweight (singleton liveborn)								
Very Low Birthweight								
(under 1500 grams)	0	(0.0%)	5	(1.4%)	1	(1.0%)	3	(2.4%)
Low Birthweight								
(under 2500 grams)	12	(9.7%)	33	(9.5%)	9	(9.4%)	14	(11.0%)

Table 2.4: FINDINGS

- The rate of fetal deaths among women with minimal treatment (30.3 per 1,000) appears higher than the rate for the other three groups of treated substance abusers (10.0 to 15.5 per 1,000); however, because of the small size of the groups and the rareness of the event, such differences could occur by chance ($p>.2$).

- The rate of infant mortality among infants born to women with both residential and outpatient treatment (20.2 per 1,000) appears higher than the rate for the other three groups of treated substance abusers (7.8 to 15.2 per 1,000); however, because of the small size of the groups and the rareness of the event, such differences could occur by chance ($p>.3$).

- Almost 60% of the infants born to women with residential treatment were judged to be at high risk of imminent harm in accepted referrals for child abuse or neglect to Child Protective Services. A smaller proportion of infants born to women with minimal treatment (42%) or outpatient only treatment (37%) had accepted referrals to CPS.

- Approximately 25% of the infants born to women with residential treatment were placed outside the home by Child Protective Services compared to lower rates of out-of-home placements among the minimal treatment (17%) or outpatient only group (14%).

- Women who received only residential substance abuse treatment had consistently poorer birth outcomes than did other women with prenatal substance abuse treatment, with 18% premature, 7.1% small for gestational age, and 11.0% low birthweight (singletons only). However, women who received both outpatient and residential treatment had better birth outcomes (12.4% premature, 4.1% small for gestational age, and 9.4% low birthweight).

- Singleton infants born to women in the two groups with outpatient treatment had consistently better birth outcomes than did the other two groups, with about 12.5% premature, 4.2% small for gestational age, and 9.5% low birthweight (under 5.5 pounds).

Table 2.5

MEDICAL HISTORY OF MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=122)		Outpatient Treatment Only (N=336)		Residential and Outpatient Treatment (N=99)		Residential Treatment Only (N=129)	
Preterm Labor								
Yes	26	(21.3%)	58	(17.3%)	21	(21.2%)	28	(21.7%)
No	96	(78.7%)	278	(82.7%)	78	(78.8%)	101	(78.3%)
Prenatal Injuries or Fractures								
Yes	19	(15.6%)	41	(12.2%)	17	(17.2%)	24	(18.6%)
No	103	(84.4%)	295	(87.8%)	82	(82.8%)	105	(81.4%)
Prenatal Emergency Services Use								
Yes	58	(47.5%)	141	(42.0%)	57	(57.6%)	69	(53.5%)
No	64	(52.5%)	195	(58.0%)	42	(42.4%)	60	(46.5%)
Mental Health Diagnoses								
Neurotic Disorders	3	(2.5%)	18	(5.4%)	6	(6.1%)	7	(5.4%)
Affective Psychoses	8	(6.6%)	13	(3.9%)	3	(3.0%)	5	(3.9%)
Depressive Disorders	3	(2.5%)	6	(1.8%)	1	(1.0%)	8	(6.2%)
Personality Disorders	1	(0.8%)	4	(1.2%)	6	(6.1%)	4	(3.1%)
Schizophrenic Disorders	2	(1.6%)	3	(0.9%)	1	(1.0%)	2	(1.6%)
Other Mental Disorders	2	(1.6%)	0	(0.0%)	0	(0.0%)	1	(0.8%)
Any of the Above:	12	(9.8%)	36	(10.7%)	13	(13.1%)	18	(14.0%)
Average Length Of Delivery Stay	3.5 days		4.0 days		3.6 days		3.9 days	
Subsequent Delivery Within Two Years								
Yes	27	(22.1%)	31	(9.2%)	10	(10.1%)	15	(11.6%)
No	95	(77.9%)	305	(90.8%)	89	(89.9%)	114	(88.4%)

Table 2.5: FINDINGS

- The rate of diagnosis of preterm labor was somewhat lower among women in the outpatient only group (17%) than among the other three groups of treated substance abusers (21% to 22%).

- The proportion of women with a prenatal injury or fracture was lower in the outpatient only treatment group (12%) than in the other three groups of substance abusers (residential only, 19%; residential and outpatient, 17%; minimal treatment, 16%).

- Over half the women in the residential treatment groups used Emergency Services in the prenatal period (54% to 58%) compared to 42% of women in the outpatient only group and 48% of women with minimal treatment.

- Slightly higher proportions of women in the residential treatment groups were diagnosed with some mental disorder (13% to 14%) compared to women in the outpatient treatment only group (11%) or women with minimal treatment (10%).

- Over 20% of women with minimal treatment had a subsequent Medicaid-paid delivery within two years, almost twice the proportion for the other three groups of treated substance abusers (9.2% to 11.6%).

Table 2.6

COMPLICATIONS OF PREGNANCY, LABOR AND DELIVERY AMONG MEDICAID WOMEN GIVING BIRTH 7/1/91-6/20/92 BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=122)		Outpatient Treatment Only (N=336)		Residential and Outpatient Treatment (N=99)		Residential Treatment Only (N=129)	
Categories Including Drug Diagnoses								
Other Current Conditions	78	(63.9%)	168	(50.0%)	89	(89.9%)	117	(90.7%)
Fetal Abnormality	17	(13.9%)	27	(8.0%)	18	(18.2%)	20	(15.5%)
Medical Complications								
Other Complications of Pregnancy	51	(41.8%)	112	(33.3%)	38	(38.4%)	49	(38.0%)
Other Fetal or Placental Probems	46	(37.7%)	134	(39.9%)	33	(33.3%)	58	(45.0%)
Indications for Interventions	29	(23.8%)	36	(10.7%)	8	(8.1%)	14	(10.9%)
PROM less than 24 hrs	9	(7.4%)	19	(5.7%)	4	(4.0%)	10	(7.8%)
PROM more than 24 hrs	2	(1.6%)	11	(3.3%)	5	(5.1%)	8	(6.2%)
Obstetric Complications (related to fetal size)								
Disproportion	7	(5.7%)	15	(4.5%)	6	(6.1%)	7	(5.4%)
Obstructed Labor	4	(3.3%)	26	(7.0%)	6	(6.1%)	8	(6.2%)
Lacerations	26	(21.3%)	89	(26.5%)	21	(21.2%)	24	(18.6%)
Structural Complications (independent of fetal size)								
Malposition; Breech Extraction	13	(10.8%)	31	(9.2%)	8	(8.1%)	13	(10.1%)
Umbilical Cord Complications	22	(18.0%)	64	(19.6%)	24	(24.2%)	21	(16.3%)
Other Complications								
Abnormality of Labor	20	(16.4%)	41	(12.2%)	20	(20.2%)	21	(16.3%)
Long Labor	4	(3.3%)	12	(3.6%)	2	(2.0%)	8	(6.2%)
Obstetrical Trauma	9	(7.4%)	18	(5.4%)	2	(2.0%)	6	(4.7%)

Table 2.6: FINDINGS

- The diagnostic categories Other Current [Maternal] Conditions (ICD-9 648) and Fetal Abnormality (ICD-9 655) include some ICD-9 codes used to identify substance abuse and codes used on claims for hospital-based residential treatment. This explains the very high proportion of women in the residential treatment groups with these codes. On the other hand, remarkably few of the fetuses of women with outpatient treatment only (8.0%) were diagnosed with a fetal abnormality (including effects of substance abuse), compared to 15.5% to 18.2% of fetuses of women with residential treatment.

- The rate of Other Complications of Pregnancy was highest for women with minimal treatment (41.8%) and lowest for women with outpatient treatment only (33.3%). (The category Other Complications of Pregnancy (ICD-9 646) includes kidney disease, liver disorders, infections of genitourinary tract, edema, excessive weight gain, peripheral neuritis, and other specified and unspecified complications.)

- Other Fetal or Placental Problems were diagnosed with greater frequency among substance abusers with residential treatment only (45.0%), compared to less than 40% for women in the other groups. (The category Other Fetal or Placental Problems (ICD-9 656) includes fetal distress, poor fetal growth, excessive fetal growth, abnormal placenta, fetal-maternal hemorrhage, Rh and other blood group incompatibility, intrauterine death, and other specified and unspecified fetal and placental problems.)

- Indications for Interventions (ICD-9 659) were diagnosed up to three times more often among women with minimal treatment compared to women in the other groups (23.8% versus 8.1% to 10.9%).

- Obstetric complications related to some degree to the size of the fetus and those relatively independent of fetal size occurred with generally the same frequencies among these groups.

- The rate of Abnormalities of Labor (ICD-9 661) was highest for the residential and outpatient treatment group (20.2%).

Table 2.7

MEDICAID EXPENDITURES FOR MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY PRENATAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=122)			**Outpatient Treatment Only (N=336)**			**Residential and Outpatient Treatment (N=99)**			**Residential Treatment Only (N=129)**		
	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment
Prenatal Period												
Inpatient	20	$3,388	$555	50	$3,262	$485	20	$2,175	$439	34	$3,174	$837
Prenatal Outpatient	118	1,369	1,325	327	1,227	1194	95	1,178	1,131	123	1,278	1218
Other Outpatient	118	404	390	329	506	496	99	452	452	123	413	394
MSS and MCM	96	469	369	259	523	403	84	660	560	103	508	405
Subtotal:			$2,640			$2,578			$2,583			$2,854
Delivery and Postpartum												
Delivery	115	$2,755	$2,597	317	$2,734	$2,580	95	$2,851	$2,736	122	$2,867	$2,712
Other Inpatient	4	3,023	99	12	3,543	127	1	3,286	33	7	4,605	250
Outpatient	88	328	237	259	324	250	79	410	327	92	285	204
MSS and MCM	79	252	163	203	273	165	65	314	206	87	307	207
Subtotal:			$3,096			$ 3,121			$3,302			$3,372
Medical Care Payments:			**$5,735**			**$5,700**			**$5,885**			**$6,226**
Substance Abuse Treatment (includes assessment and detox)												
Prenatal Inpatient	22	$1,413	$255	5	$1,498	$22	80	$4,982	$4,026	98	$5,163	$3,922
Postpartum Inpatient	2	3,731	61	0	0	0	4	3,099	125	15	2,728	317
Prenatal Outpatient	81	134	89	253	588	443	91	541	498	81	121	76
Postpartum Outpatient	25	208	43	143	205	87	61	244	150	31	276	66
Substance Abuse Payments:	**93**	**$587**	**$447**	**261**	**$711**	**$553**	**95**	**$5,001**	**$4,799**	**112**	**$5,047**	**$4,382**
Total Payments For Maternal Care:			**$6,183**			**$6,252**			**$10,684**			**$10,607**

Table 2.7: FINDINGS

- For women with Medicaid expenditures for substance abuse treatment, the average Medicaid payment for substance abuse treatment among women with residential treatment ($5,001 to $5,047) was over $4,000 higher than that for the outpatient only group ($711) or the minimal treatment group ($587).

- Among women with only residential treatment, the average Medicaid payment for prenatal and postpartum medical care exclusive of substance abuse treatment ($6,226) was about $500 higher than the average payments for the other three groups ($5,700 to $5,885).

- Over 26% (34÷129) of women with only residential treatment had a prenatal hospitalization that was not related to substance abuse, substantially more than the proportions for women with residential and outpatient treatment (20% [20÷99]), minimal treatment (16% [20÷122]), or only outpatient treatment (15% [50÷336]). Two explanations are possible: either women in residential treatment have greater frequency of health problems needing hospitalization or they are more likely to be hospitalized for less severe conditions.

Notes for Table 2.7:

Users: The number of persons with Medicaid expenditures for that type of service. For example, 20 women in the minimal treatment group had inpatient expenditures in the prenatal period.

Users Average Payment: The average Medicaid expenditure calculated for persons with expenditures for that type of service. For example, the average Medicaid expenditure for the 20 women in the minimal treatment group who had inpatient expenditures in the prenatal period was $3,388 (20 x $3,388.39 = $67,768).

Group Average Payment: The average Medicaid expenditure calculated for all persons in the group. For example, the average Medicaid expenditure for prenatal inpatient events for the 122 Medicaid women in the minimal treatment group was $555 (122 x $555.47 = $67,768).

Table 2.8

MEDICAID EXPENDITURES FOR INFANTS OF MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 BY MATERNAL SUBSTANCE ABUSE TREATMENT MODALITY

	Minimal Treatment (N=116)			**Outpatient Treatment Only (N=326)**			**Residential and Outpatient Treatment (N=96)**			**Residential Treatment Only (N=125)**		
	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment
Payments for Infant Care (first year of life, singleton liveborn only)												
Inpatient (non NICU)	101	$3,370	$2,934	280	$1,545	$1,327	83	$1,177	$1,018	109	$2,010	$1,753
Inpatient NICU	17	15,068	2,208	30	19,174	1,764	8	8,948	746	14	11,981	1,342
Outpatient	106	1,010	923	314	955	920	92	858	823	119	934	889
Total Payments For Infant Care:			**$6,065**			**$4,011**			**$2,586**			**$3,984**

Table 2.8: FINDINGS

- The average Medicaid expenditure for infant care in the first year of life for the children of women who received both residential and outpatient treatment was $2,586, substantially lower than for infants born to substance abusers in the other three groups. The average payment for infants of women with minimal treatment was 2.3 times higher ($6,065), and payments for infants born to women with only outpatient treatment or only residential treatment were 1.5 times higher ($3,984 to $4,011).

- For infants with non-NICU inpatient stays, Medicaid payments for infants born to women who received minimal treatment averaged $3,370 for the first year of life, substantially more than the average expenditures for infants in the other three groups ($1,177 to $2,010).

- Almost 15% of singleton infants born to women who received minimal treatment had inpatient events involving Neonatal Intensive Care Unit stays (17÷116=14.7%) compared to 11.2% (14÷125) of infants born to women with only residential treatment, 9.2% (30÷326) of infants born to women with only outpatient treatment, or 8.3% (8÷96) of infants born to women with residential and outpatient treatment.

Notes for Table 2.8:

Users: The number of infants with Medicaid expenditures for that type of service. For example, for singleton infants born to women with minimal treatment, 101 had non-NICU inpatient expenditures in their first year of life.

Users Average Payment: The average Medicaid expenditure calculated for infants with expenditures for that type of service. For example, for singleton infants born to women with minimal treatment, the average Medicaid expenditure for the 101 infants who had non-NICU inpatient expenditures in their first year of life was $3,370 (101 x $3,370.00 = $340,370).

Group Average Payment: The average Medicaid expenditure calculated for all infants born to women in the group. For example, for the 116 singleton infants born to women with prenatal substance abuse treatment, the average Medicaid expenditure for non-NICU inpatient events was $2,934 (116 x $2,934.22 = $340,370).

Discussion

This chapter examined the relationship between the demographic characteristics, risk factors and birth outcomes of identified substance abusers and the amount and type of substance abuse treatment which they received. The treatment which a woman receives should reflect her personal situation, medical risks, and the nature of her substance abuse problem. The recommended course of treatment for pregnant substance abusers with a serious abuse problem is a continuum of care including a period of residential treatment followed by outpatient treatment. Outpatient treatment is appropriate for pregnant women with social supports, judged able to maintain sobriety with outpatient services, or unwilling to accept residential or inpatient treatment. About half of the women who received prenatal substance abuse treatment received only outpatient treatment. For women who received residential treatment, 43% failed to receive outpatient treatment.

Substance abusers in the outpatient only group tended to have fewer high risk characteristics than women in the other treatment groups. They were more likely to be pregnant with their first child, to have an alcohol problem but not a serious problem with illicit drugs, to be married, and not to receive income assistance. They also had fewer medical risk factors for poor birth outcomes such as preterm labor, trauma incidents, mental health diagnoses and prenatal hospitalizations not related to substance abuse. The birth outcomes for women in this group were somewhat more positive, with lower rates of referral to CPS or out-of-home placement, fewer NICU stays, and fewer babies who were premature or small for gestational age compared to women in the other treatment groups.

Substance abusers in the two residential treatment groups had many high risk characteristics. They were more likely to be single, to abuse cocaine and marijuana in addition to alcohol, to have prior children, and to be older than women who received only outpatient or minimal treatment. Women in residential treatment had more adverse medical characteristics than women who received only outpatient treatment, with high rates of preterm labor, prenatal injuries or fractures, Emergency Services use, mental health diagnoses, and prenatal hospitalizations not related to substance abuse. The medical, personal, and substance abuse characteristics of women in residential treatment indicate that they were at high risk for poor birth outcomes and that they were appropriately placed in residential treatment; the cost of residential programs was substantial, with the average hospital-based stay costing about $5,000. Infants of women who had both residential and outpatient treatment were less likely to be low birthweight, premature, or small for gestational age than infants born to substance abusers who had only residential treatment.[1] Infants of mothers with both residential and outpatient treatment also had the lowest average Medicaid payments in their first year of life ($2,586), even lower than those for infants born to non-substance abusing Medicaid women ($2,776). These data indicate that pregnant women who receive residential treatment should also receive a course of outpatient substance abuse treatment.

Women in the minimal treatment group received little substance abuse treatment. In terms of risks for adverse birth outcomes, their personal characteristics would appear to place them

[1] The adverse outcomes for infants in the residential only group are not the result of the high proportion of black women in this group, for black infants in the residential only group fare substantially better than white infants.

between the outpatient only group and the residential groups. Birth outcomes for the minimal treatment group were worse than those for the outpatient only and residential and outpatient treatment groups but slightly better than those for women with only residential treatment. The Medicaid expenditures for infants born to this group of women, however, were remarkably high. Among women with minimal treatment, average Medicaid expenditures in the first year of life for infants were 1.5 times higher than expenditures for infants born to women in the three other treatment groups. Over one-fifth of the women with minimal treatment had another child within two years.

The relationship between the type and duration of substance abuse treatment and birth outcomes is complex. Women who receive different types of substance abuse treatment also differ in their personal, substance abuse, and medical characteristics. This study found that women with more serious drug and medical problems appear to be appropriately referred to residential treatment. For women in residential treatment, whether or not they received outpatient treatment also appears to be consequential, for women who received both residential and outpatient treatment had better birth outcomes than women who received only residential treatment. However, more than half of the women in residential treatment failed to make the transition to outpatient treatment, a transition less frequently achieved for black women. Women who received little substance abuse treatment also are of particular concern, for their infants had very high medical costs in the first year of life and many of these women had another child within two years. A closer examination of the differences in the characteristics of women receiving different types and amounts of substance abuse treatment is necessary in order to understand more fully the impact of substance abuse treatment on infant health.

The Omnibus Drug and Maternity Care Access Acts of 1989 increased the availability of substance abuse treatment options for pregnant women. This study indicates that the placement of pregnant women in different treatment modalities is consistent with their personal, substance abuse, and medical characteristics. For women referred to residential treatment and who tend to have high risk characteristics and serious substance abuse problems, the improved birth outcomes for women who receive a fuller continuum of care are encouraging. Challenges remain in reaching women who receive only minimal treatment as well as those who fail to achieve the transition from residential to outpatient treatment.

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APPENDICES

Appendix A: Identification of Substance Abuse in TARGET Database

Three major files from TARGET and one file from SAMS were used to combine substance abuse treatment information maintained by DSHS's Division of Alcohol and Substance Abuse. The three TARGET files and the variables used were: discharge file (id, provider number, admission and discharge dates); payment or service funding file (id, provider number, admission date, treatment modality); and activity file (id, provider number, admission date, activity date and activity date). The activity file contains information starting on January 1, 1992. SAMS, the management information system used prior to the development of TARGET, contained information on outpatient activity prior to January 1, 1992.

The discharge and payment files were merged based on id, provider number, and admission date to create a discharge/payment file containing id, provider number, admission and discharge dates, and treatment modality. Records with out-of-range admission and discharge dates were deleted: Intensive Inpatient stays of over 60 days, Intensive Outpatient stays over 180 days, and entries where the admission date was equal to or greater than the discharge date. Only records with the following modalities were retained: intensive inpatient (II), intensive outpatient (IO), Outpatient (OP), Recovery House (RH), and Long Term Care (LT). For all modalities other than IO and OP, the duration of treatment was the length of time between the admission and discharge date.

The computation of length of treatment for outpatient (IO and OP) treatment spans was more complex. Since the treatment was not residential, a person could cease attending treatment sessions and not have a discharge noted in their record for many months. The activity file created using information from SAMS and TARGET contains information for most outpatient events. It was linked to the discharge/payment file by provider number and admission date and used to construct treatment spans based on the difference between the recorded admission date and the last day that outpatient treatment occurred as indicated in the activity file. As discussed in Appendix B, the First Steps Database also contained information on outpatient treatment. When possible, this information was linked to TARGET to construct outpatient treatment spans. A separate problem in combining information in the activity file with information in the linked discharge/payment file was the occurrence of cases in the activity files which did not occur in the discharge/payment file. There were 212 such records, 146 in the TARGET activity file and 66 from the SAMS activity file. Since these records contained both admission dates and activity information, treatment spans were created and they were retained in the analysis. In the prenatal period, there were 73 women whose only indication of prenatal substance abuse treatment was outpatient treatment records in TARGET which could not be linked to any treatment activity. Another fourteen women had outpatient treatment spans which could not be linked to any treatment activity in addition to treatment spans which could be associated with a definite duration. These fourteen women were included in the statewide analysis in Chapter One and excluded from the treatment modality analysis in Chapter Two.

Data on drug(s) of choice were obtained from the substance used file. Information on the first drug of choice (regardless of frequency of use) and any additional drugs with a stated frequency of use of at least once a month was retained.

Appendix B: Identification of Substance Abuse Treatment in First Steps Database

The First Steps Database contains information on outpatient and inpatient claims submitted for payment for Medicaid clients. Information on hospital-based substance abuse treatment was obtained using Diagnostic Related Group codes (DRGs) and hospital procedure codes. Outpatient treatment was identified using special outpatient procedure codes developed by Medicaid for substance abuse treatment.

DRGs Indicating Substance Abuse Treatment*

433 Alcohol/Drug Abuse/Dependence, Left against medical advice
434 Alcohol/Drug Abuse/Dependence, Detox or other Sympt Treat w cc
435 Alcohol/Drug Abuse/Dependence, Detox or other Sympt Treat w/o cc
436 Alcohol/Drug Dependence, with Rehabilitation Therapy
437 Alcohol/Drug Dependence, Detox and Rehabilitation Therapy
743 Opioid Abuse or Dependence, Left Against Medical Advice
744 Opioid Abuse or Dependence, With Complications
745 Opioid Abuse or Dependence, Without Complications
746 Cocaine or Other Drug Abuse or Dependence, Left Against Medical Advice
747 Cocaine or Other Drug Abuse or Dependence, With Complications
748 Cocaine or Other Drug Abuse or Dependence, Without Complications
749 Alcohol Abuse or Dependence, Left Against Medical Advice
750 Alcohol Abuse or Dependence, With Complications
751 Alcohol Abuse or Dependence, Without Complications

* Note: If DRG was 433-437 or 743-751 but a hospital procedure code indicated a detox hospitalization, then the hospital stay was not considered to indicate substance abuse treatment.

Inpatient Hospital Procedure Codes Indicating Substance Abuse Treatment

96.61 Alcohol Rehabilitation
96.63 Alcohol Rehabilitation and Detoxification
96.64 Drug Rehabilitation
96.66 Drug Rehabilitation and Detoxification
96.67 Combined Alcohol/Drug Rehabilitation
96.69 Combined Alcohol/Drug Rehabilitation and Detoxification

Outpatient Procedure Codes Indicating Substance Abuse Treatment

0012M	Drug Abuse: Individual Therapy - Full Visit
0013M	Drug Abuse: Individual Therapy - Brief Visit
0014M	Drug Abuse: Group Therapy
0015M	Drug Abuse: Activity Therapy
0022M	Alcohol Abuse: Individual Therapy - Full Visit
0023M	Alcohol Abuse: Individual Therapy - Brief Visit

0024M	Alcohol Abuse Outpatient: Group Therapy
0143M or 0153M	DASA Code: Individual Therapy - Full Visit
0144M or 0154M	DASA Code: Individual Therapy - Brief Visit
0145M or 0155M	DASA Code: Group Therapy
0148M or 0158M	DASA Code: Acupuncture
0149M or 0159M	DASA Code: Group Therapy per 1/4 Hour
0175M	DASA Code: Adolescent Residential Treatment
0176M	DASA Code: Residential Treatment Room and Board
0180M	FSPLUS: Long Term Residential
0181M	FSPLUS: Intensive Inpatient
0182M	FSPLUS: Medical Stabilization
0186M	FSPLUS: Room and Board
9005M	Fed Qual Hlth Ctr - Chemical Dependency

Appendix C: Linkage Between TARGET and First Steps Database

The First Steps Database contains information on hospital-based intensive inpatient treatment and outpatient treatment (from procedure table). TARGET contains information on freestanding residential treatment (intensive inpatient, recovery house and long-term care) and outpatient treatment (intensive outpatient and outpatient). In order to handle cases where a woman was listed as being in more than one treatment modality simultaneously the following procedure was followed:

(1) Treatment records were categorized as either residential or outpatient. Residential treatment was defined as any treatment in the following modalities: Hospital Based (HB), Intensive Inpatient (II), Recovery House (RH), and Long Term Care (LT). Outpatient treatment was defined as Intensive Outpatient (IO) and Outpatient (OP).

(2) Treatment records were ordered by admission dates for every individual.

(3) Overlapping residential treatment spans were combined. For example, if a woman went from hospital-based treatment to recovery house, or information in First Steps and TARGET suggested overlapping residential treatment, a single residential treatment span was constructed.

(4) The same process was repeated for outpatient treatment.

(5) The information on residential and outpatient treatment spans was combined. Residential treatment spans were given precedence over outpatient treatment spans. For example, if a woman was in outpatient treatment and experienced a residential stay and then was referred back to outpatient treatment, she may not have been formally discharged from outpatient treatment; in such a case the outpatient treatment span would be split so that the treatment history reflected an outpatient span followed by a residential span and then concluding with another outpatient span. Any double counting of treatment spans between residential and outpatient treatment spans was eliminated.

Appendix D: Identification of Substance Abuse in First Steps Database

The First Steps Database contains information on medical diagnoses assigned by health care providers on Medicaid claims submitted for payment. These diagnosis codes (ICD-9) on Medicaid claims were used to identify Medicaid clients who abused substances.

Maternal Diagnoses Indicating Substance Abuse in the Mother

Diagnosis codes beginning with:

- 291 Alcoholic psychoses
- 292 Drug psychoses/withdrawal syndrome
- 303 Alcohol dependence
- 304 Drug dependence
- 305 Nondependent drug/alcohol abuse (except 305.1 for Tobacco Abuse)

The following specific codes:

- 571.1 Acute alcoholic hepatitis
- 648.3 Drug dependence complicating pregnancy

Infant Diagnoses Indicating Probable Substance Abuse by the Mother During Pregnancy

- 760.71 Maternal alcohol affecting newborn (fetal alcohol syndrome)
- 760.72 Maternal narcotic affecting newborn
- 760.73 Maternal hallucinogen affecting newborn
- 760.75 Maternal cocaine affecting the newborn
- 779.5 Newborn drug withdrawal syndrome

Appendix E: Identification of Abused Substances in First Steps Database

The First Steps Database contains limited information on the specific substances which women abused. This information is contained in the medical diagnoses (ICD-9 codes) assigned by health care providers on Medicaid claims. Unfortunately many frequently used diagnosis codes do not indicate the specific substance abused.

First Steps Diagnoses:

Alcohol:	
291	Alcoholic psychoses
303	Alcohol dependence
305.0	Alcohol abuse
571.1	Acute alcoholic hepatitis
760.71	Maternal alcohol affecting newborn (fetal alcohol syndrome)
Cocaine:	
304.2	Cocaine dependence
305.6	Cocaine abuse
760.75	Maternal cocaine affecting the newborn
Opiate:	
304.0	Opioid type dependence
304.7	Combinations of opioid type drug with any other
305.5	Opioid abuse
760.72	Maternal narcotic affecting newborn
Barbiturates:	
304.1	Barbiturate and similarly acting sedative dependence
305.4	Barbiturate and similarly activating sedative abuse
Marijuana:	
304.3	Cannabis dependence
305.2	Cannabis abuse
Amphetamine:	
304.4	Amphetamine and other psychostimulant dependence
305.7	Amphetamine or related acting sympathomimetic abuse
Hallucinogens:	
304.5	Hallucinogen dependence
305.3	Hallucinogen abuse
760.73	Maternal hallucinogen affecting newborn

Miscellaneous or Unspecified drug abuse

292	Drug psychoses
304.	Drug dependence
304.6	Other specified drug dependence (absinthe, glue sniffing)
304.8	Combinations of drug dependence excluding opioids
304.9	Unspecified drug dependence
305.	Nondependent drug/alcohol abuse
305.8	Antidepressant type abuse
305.9	Other, mixed, or unspecified drug abuse
648.3	Drug dependence complicating pregnancy
779.5	Newborn drug withdrawal syndrome

Appendix F: Identification of Mental Health Disorders in First Steps Database

The First Steps Database contains information on medical diagnoses assigned by health care providers on the Medicaid claims submitted for payment for Medicaid clients. These diagnosis codes (ICD-9) from Medicaid claims were used to identify Medicaid clients who were identified as having mental health disorders not related to substance abuse. Diagnoses for mental health disorders fall in the range 290 to 319. Below is a list of the codes and the major disorders identified with that code and whether or not they were used for the identification of mental health disorders.

Included Diagnoses:

295	Schizophrenic disorders
296	Affective psychoses (bipolar, manic, depressive)
297	Paranoid states
298	Other nonorganic psychoses
299	Psychoses with origin specific to childhood
300	Neurotic disorders
301	Personality disorders
302	Sexual deviations and disorders
311	Depressive disorder, not elsewhere classified

Excluded Diagnoses:

290	Senile and presenile organic psychotic conditions
291	Alcoholic psychoses
292	Drug psychoses/withdrawal syndrome
293	Transient organic psychotic conditions
294	Other organic psychotic conditions (chronic)
303	Alcohol dependence
304	Drug dependence
305	Nondependent drug/alcohol abuse
306	Physiological malfunction arising from mental factors
307	Special symptoms or syndromes, not elsewhere classified
308	Acute reaction to stress
309	Adjustment reaction
310	Specific nonpsychotic mental disorders due to organic brain damage
312	Disturbance of conduct, not elsewhere classified
313	Disturbance of emotions specific to childhood and adolescence
314	Hyperkinetic syndrome of childhood
315	Specific delays in development
316	Psychic factors associated with diseases classified elsewhere
317	Mild mental retardation
318	Other specified mental retardation
319	Unspecified mental retardation

Appendix G: Complications of Pregnancy, Labor and Delivery in First Steps Database

Categories Including Drug Diagnoses

Other Current Conditions (ICD-9 648) -- diabetes mellitus, thyroid dysfunction, anemia, drug dependence, mental disorders, congenital cardiovascular disorders, other cardiovascular diseases, bone and joint disorders, abnormal glucose tolerance, and nutritional deficiencies

Fetal Abnormality (ICD-9 655) -- central nervous system malformation in fetus, chromosomal abnormality in fetus, hereditary disease in family possibly affecting fetus, suspected damage to fetus from viral disease in mother, suspected damage to fetus from other disease in the mother (including alcohol addiction), suspected damage to fetus from drugs, suspected damage to fetus from radiation, and other known or suspected fetal abnormality

Medical Complications

Other Complications of Pregnancy (ICD-9 646) -- kidney disease, liver disorders, infections of genitourinary tract, edema, excessive weight gain, peripheral neuritis, and other specified and unspecified complications

Other Fetal or Placental Problems (ICD-9 656) -- fetal distress, poor fetal growth, excessive fetal growth, abnormal placenta, fetal-maternal hemorrhage, Rh and other blood group incompatibility, intrauterine death, and other specified and unspecified fetal and placental problems

Indications for Interventions (ICD-9 659) -- failed mechanical, medical or unspecified induction, maternal pyrexia during labor, generalized infection during labor, grand multiparity, elderly primigravida, and other specified or unspecified indications for intervention related to labor and delivery

PROM Less than 24 Hours (ICD-9 658.1) -- premature rupture of the membranes less than 24 hours before the onset of labor

PROM More than 24 Hours (ICD-9 658.2) -- delayed delivery after spontaneous or unspecified rupture of membranes including premature rupture of the membranes 24 hours or more prior to the onset of labor.

Obstetric Complications (Related to Fetal Size)

Disproportion (ICD-9 653) -- disproportion of mixed fetal and maternal origin

Obstructed Labor (ICD-9 660) -- obstruction caused by malposition of fetus, pelvic conditions, failed trial of labor, failed forceps or vacuum extraction, and other causes of obstructed labor

Lacerations (ICD-9 664) -- perineal lacerations and other specified or unspecified trauma to perineum and vulva

Structural Complications (Independent of Fetal Size)

Malposition; Breech Extraction (ICD-9 652.2-652.9; 669.6) -- breech, transverse, or other specified or unspecified malposition or malpresentation, and breech extraction

Umbilical Cord Complications (ICD-9 663) -- prolapse of cord, cord entanglement, and other specified or unspecified umbilical cord complications

Other Complications

Abnormality of Labor (ICD-9 661) -- primary or secondary uterine inertia, precipitate labor, and other specified or unspecified abnormality of forces of labor

Long Labor (ICD-9 662) -- prolonged first or second stage of labor, delayed delivery of second twin, etc.

Obstetrical Trauma (ICD-9 665) -- rupture, inversion, or laceration of uterus, high vaginal laceration, injury to pelvic organs and other specified or unspecified obstetrical trauma

Appendix H: Demographic Characteristics, Prenatal Care, and Birth Outcomes for Women Using Methadone in the Prenatal Period

Methadone maintenance is the treatment of choice for pregnant heroin users. Methadone has some of the same negative effects on fetuses as heroin such as growth retardation, preterm delivery and withdrawal (Edelin, et al., 1988; Jones and Lopez, 1990). However, the maintenance of a pregnant woman on methadone stabilizes her drug use, encourages prenatal care, reduces risk of infection, acute withdrawal, and poor nutrition. The following tables compare the 87 women on methadone maintenance to women who received other types of substance abuse treatment. The major findings are:

- Compared to other women with prenatal substance abuse treatment, women who received methadone maintenance during pregnancy were older (29.4 years versus 24.9) and were less likely to receive prenatal care in their first trimester of pregnancy (31% versus 57%).

- Women who received methadone maintenance had consistently poorer birth outcomes than did women who received other types of prenatal substance abuse treatment, with 26.8% premature, 7.2% small for gestational age, and 16.0% low birthweight (under 5.5 pounds).

- Medicaid expenditures for infant care in the first year of life for infants born to women who received methadone during pregnancy were 1.5 times higher than those for infants of women with other types of prenatal substance abuse treatment ($6,331 versus $4,205). Most of the increased cost was due to much higher inpatient expenses, both inpatient non-NICU expenses and NICU expenses.

- Medicaid expenditures for maternal medical expenses for women who received methadone during pregnancy are substantially higher than those for women with other types of prenatal substance abuse treatment ($11,046 versus $7,661). Much of the increased cost was due to high delivery expenses and other inpatient medical expenses.

Table H.1: CHARACTERISTICS OF WOMEN GIVING BIRTH 7/1/91-6/30/92
METHADONE AND PRENATAL SUBSTANCE ABUSE TREATMENT GROUP

	Prenatal Methadone Treatment (N=87)		Prenatal Substance Abuse Treatment (N=730)	
Race				
White	60	(69.0%)	515	(70.6%)
Hispanic	3	(3.4%)	21	(2.9%)
Black	14	(16.1%)	116	(15.9%)
Native American	4	(4.0%)	64	(8.8%)
Asian	2	(2.3%)	3	(0.4%)
Other or Unknown	4	(4.6%)	11	(1.5%)
Age				
12-17	1	(1.1%)	83	(11.4%)
18-29	2	(2.3%)	68	(9.3%)
10-24	12	(13.8%)	205	(28.1%)
25-29	27	(31.0%)	200	(27.4%)
30-59	45	(51.7%)	173	(23.7%)
Missing	0	(0.0%)	1	(0.1%)
Average Age	29.4 yrs		24.9 yrs	
Marital Status				
Married	25	(28.7%)	184	(25.2%)
Single	62	(71.3%)	542	(74.3%)
Unknown	0	(0.0%)	4	(0.6%)
Number of Prior Children				
None	22	(25.3%)	231	(31.6%)
One	29	(33.3%)	179	(24.5%)
Two or More	35	(40.3%)	316	(43.3%)
Unknown	1	(1.1%)	4	(0.6%)
Trimester Prenatal Care Began				
First	27	(31.0%)	417	(57.1%)
Second	27	(31.0%)	202	(27.7%)
Third	15	(17.2%)	43	(5.9%)
None	2	(2.3%)	8	(1.1%)
Unknown	16	(18.4%)	60	(8.2%)
Smoking Status				
Yes	50	(57.5%)	432	(59.2%)
No	10	(11.5%)	214	(29.3%)
Unknown	27	(31.0%)	84	(11.5%)
Drugs of Choice				
Alcohol	15	(17.2%)	483	(66.2%)
Cocaine	31	(35.6%)	267	(36.6%)
Marijuana	4	(4.6%)	150	(20.6%)
Amphetamines	4	(4.6%)	28	(3.8%)
Heroin	69	(79.3%)	43	(5.9%)
Barbiturates	4	(4.6%)	9	(1.2%)
Other or Unspecified	14	(16.1%)	37	(5.1%)
Missing	0	(0.0%)	37	(5.1%)
Medicaid Eligibility				
Medicaid	87	(100%)	699	(95.8%)
Non-Medicaid	0	(0.0%)	31	(4.3%)

Table H.2: BIRTH OUTCOMES FOR INFANTS BORN 7/1/91-6/30/92 FOR METHADONE AND PRENATAL SUBSTANCE ABUSE TREATMENT GROUPS

	Prenatal Methadone Treatment (N=87)		Prenatal Substance Abuse Treatment (N=736)	
Fetal Deaths				
(per 1,000 births)	3	(34.0)	11	(14.9)
Infant Mortality (preliminary)				
(per 1,000 liveborn)	4	(47.0)	8	(11.0)
Child Protective Services				
Out-of-Home Placement	25	(28.1%)	135	(18.3%)
Accepted Referral	46	(51.7%)	328	(44.6%)
Gestational Age (singleton liveborn)				
Full-term (>37 wks)	60	(73.2%)	601	(84.2%)
Premature (28-37 wks)	22	(26.8%)	96	(13.5%)
Very Premature (< 28 wks)	0	(0.0%)	4	(0.6%)
Unknown	1	(0.0%)	13	(1.8%)
Small for Gestational Age (singleton liveborn)				
Yes	6	(7.2%)	36	(5.0%)
No	76	(91.6%)	673	(94.3%)
Unknown	1	(1.2%)	5	(0.7%)
Birthweight (singleton liveborn)				
Very Low Birthweight (under 1500 grams)	1	(1.2%)	9	(1.3%)
Low Birthweight (under 2500 grams)	13	(16.0%)	68	(9.6%)

Table H.3: MEDICAID STATUS AND MEDICAL HISTORY AMONG MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 FOR METHADONE AND PRENATAL SUBSTANCE ABUSE TREATMENT GROUPS

	Prenatal Methadone Treatment (N=87)		Prenatal Substance Abuse Treatment (N=699)	
Medicaid Status				
Grant Recipients	71	(81.6%)	544	(77.8%)
Pre FS Medicaid Only	11	(12.6%)	84	(12.0%)
FS Expansion Group	3	(3.4%)	59	(8.4%)
Missing Eligibility	2	(2.3%)	12	(1.7%)
Received Maternity Support Services	57	(65.5%)	506	(72.4%)
Received Maternity Case Management	47	(54.0%)	407	(58.2%)
Preterm Labor	10	(11.5%)	134	(19.2%)
Prenatal Injuries or Fractures	13	(14.9%)	102	(14.6%)
Prenatal Emergency Services Use	41	(47.1%)	334	(47.8%)
Prenatal Mental Health Diagnoses				
Neurotic Disorders	2	(2.3%)	36	(5.2%)
Affective Psychoses	2	(2.3%)	29	(4.2%)
Depressive Disorders	3	(3.4%)	18	(2.6%)
Personality Disorders	1	(1.1%)	15	(2.2%)
Schizophrenic Disorders	1	(1.1%)	8	(1.1%)
Other Mental Disorders	0	(0.0%)	3	(0.4%)
Any of the Above:	5	(5.7%)	81	(11.6%)
Average Length of Delivery Stay	5.7 days		3.8 days	
Subsequent Delivery Within Two Years	11	(12.6%)	84	(12.0%)

Table H.4: INFANT AND MATERNAL MEDICAID EXPENDITURES FOR MEDICAID WOMEN GIVING BIRTH 7/1/91-6/30/92 FOR METHADONE AND PRENATAL SUBSTANCE ABUSE TREATMENT GROUPS

	Prenatal Methadone Treatment (N=87)			Prenatal Substance Abuse Treatment (N=699)		
	Users (n)	Users Average Payment	Group Average Payment	Users (n)	Users Average Payment	Group Average Payment
Payments For Maternal Care						
Prenatal Period						
Inpatient	16	$3,709	$682	125	$3,069	$549
Prenatal Outpatient	83	1,520	1,450	676	1,251	1,209
Other Outpatient	85	600	586	681	465	453
MSS and MCM	63	571	414	553	534	422
Subtotal:			$3,132			$2,634
Delivery and Postpartum						
Delivery	82	$3,262	$3,074	661	$2,785	$2,634
Other Inpatient	8	4,442	408	24	3,755	129
Outpatient	64	405	298	528	328	247
MSS and MCM	42	294	142	447	283	181
Subtotal:			$3,923			$3,191
Medical Care Payments:			**$7,055**			**$5,825**
Substance Abuse Treatment						
Prenatal Inpatient	34	$6,435	$2,515	205	$4,600	$1,349
Postpartum Inpatient	4	1,700	78	21	2,894	87
Prenatal Outpatient	86	1,066	1,054	511	429	314
Postpartum Outpatient	74	405	344	262	228	85
Subtotal:	87	$3,991	$3,991	567	$2,262	$1,835
Total Payments For Maternal Care:			**$11,046**			**$7,661**
Payments for Infant Care (first year of life, singleton liveborn)						
Inpatient (non NICU)	62	$3,951	$2,987	584	$1,964	$1,697
Inpatient NICU	18	10,720	2,353	71	15,177	1,594
Outpatient	73	1,113	991	644	959	914
Total Payments for Infant Care:			**$6,331**			**$4,205**